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IRA S. BERG, ESQ. CERTIFICATION

IN SUPPORT OF

CERRO COPPER PRODUCTS CO.'S COMMENT

TO PROPOSED NPL LISTING OF

SAUGET AREA 1, SAUGET, ILLINOIS

EXHIBITS 4 - 7

VOLUME II

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EXPANDED SITE INVESTIGATION
DEAD CREEK PROJECT SITES
AT CAHOKIA/SAUGET, ILLINOIS
FINAL REPORT
VOLUME 2 OF 2

May 1988

Prepared for:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Division of Land Pollution Control
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I. INTRODUCTION

The RI portion of the Dead Creek Project Remedial Investigation/Feasibility Study, as described in the Project Work Plan, includes eleven tasks to be completed. Task 5, Description of Current Situation, calls for Ecology and Environment, Inc. to prepare a description of the background information pertinent to the area and its problems and outline the purpose and need for remedial investigation in the area.

This report was prepared to provide the information on and a description of the current situation of the sites in the Dead Creek Project area. The report is organized to provide an area wide description followed by a detailed site by site description. The site by site description provides a detailed presentation of all available information concerning each site, which was acquired and evaluated during Tasks 3 and 4 of the RI.

II. GENERAL DESCRIPTION OF PROJECT AREA

Location

The Dead Creek Project area is located in and around the cities of Sauget (formerly Monsanto) and Cahokia in St. Clair County, Illinois (Figure 1). Under the scope of the RFP issued by the IEPA, the study area consists of 18 suspected uncontrolled hazardous waste sites located throughout the study area (Figure 2). The project area consists of 12 individual sites and 6 additional sectors in Dead Creek.

Areal Description and Topography

The sites to be investigated as part of the Dead Creek Project are in an area which contains a mixture of industrial, residential, commercial, farm, and undeveloped land. The sites consist of closed and active landfills, industrial property, undeveloped or currently unutilized land, residential land, and an areal drainage flowpath (Dead Creek).

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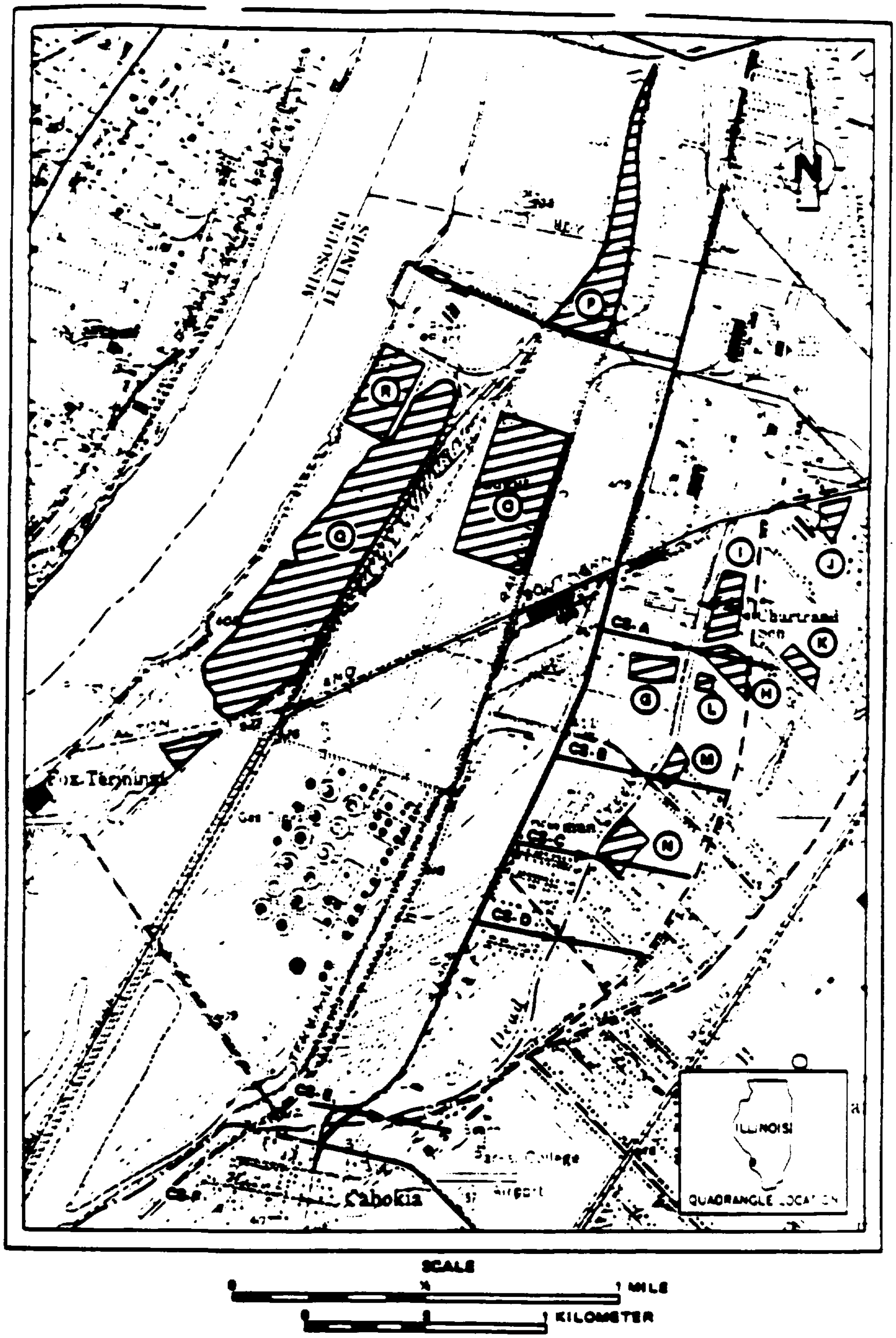

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FIGURE 2
SITE REPORTING DESIGNATIONS FOR THE DEAD CREEK PROJECT

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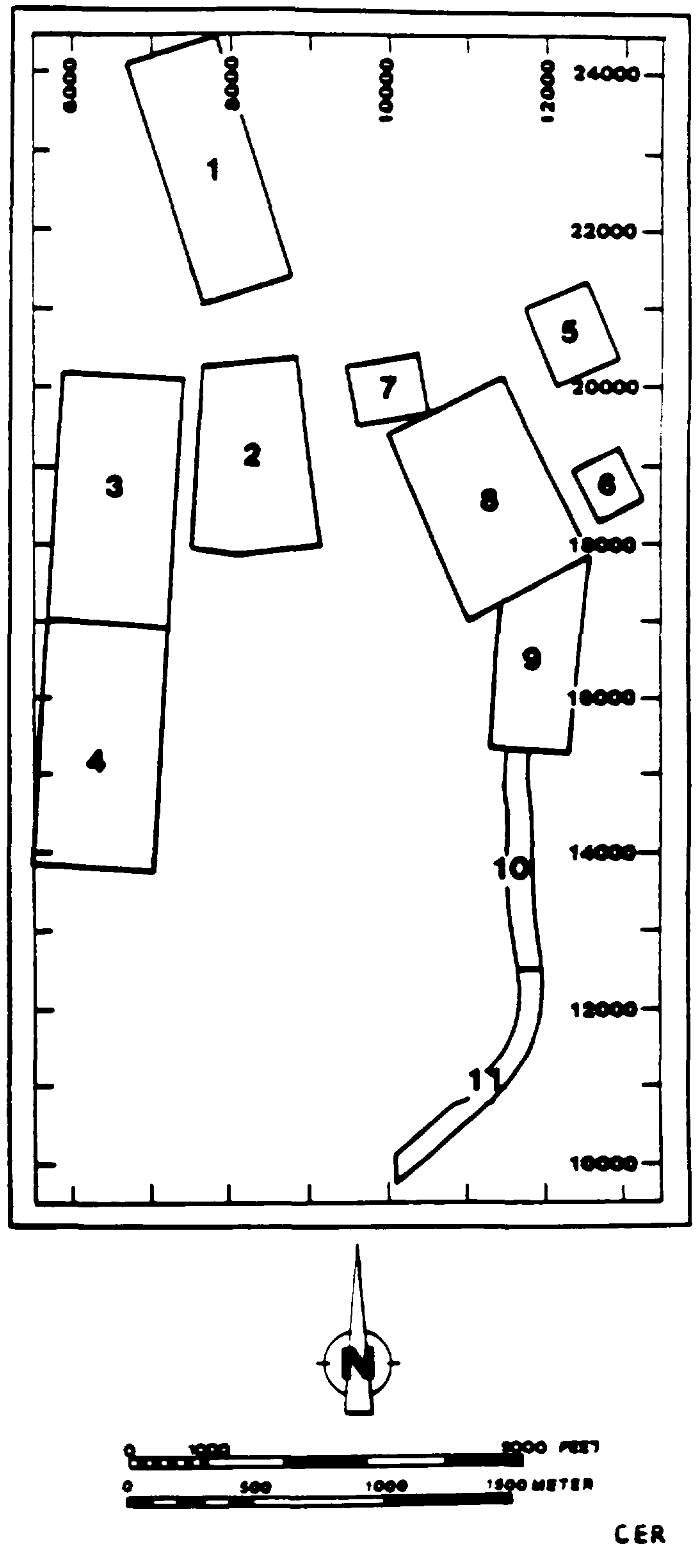

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FIGURE 3
BOUNDARIES OF ENGINEERING PLATES FOR THE DEAD CREEK SITES

underlain by basement granitic crystalline rock. The geologic formation sequence for South-Central Illinois is represented in Figure 4. The study area, the American Bottoms, and the Mississippi River channels are all located in a broad deep cut bedrock valley. The bedrock valley is delineated by bluff lines on both sides. Based upon available data, the bedrock valley has steep walls along the bluff lines while the valley bottom slopes gently toward the middle.

Within the bedrock valley, the Mississippi River has provided the primary mechanisms controlling the recent formation of geology and hydrogeology. Bergstrom, et al (1956) suggests that the bedrock valley is pre-glacial in nature; however, Willman et al (1970) concludes that insufficient data exists to suggest a pre-glacial valley structure for the Mississippi River. Nevertheless, glaciation did significantly modify and redesign the Mississippi River and its valley through both glacial and interglacial periods. These changes occurred as glacial wasting caused massive amounts of meltwater to be directed generally southward through and around bedrock and ice contacts, ultimately discharging into the Gulf of Mexico. Through geologic history, a wide and deep valley (2 to 8 miles across and up to 170 feet deep) has been carved into the predominantly soft sedimentary bedrock underlying the river (Bergstrom, 1956). Changes in stream flow, direction, and sediment load have caused this valley to fill with secondary alluvial sediments. These constantly changing parameters have resulted in the river continuously picking up and depositing (and cutting and filling) its sediment base, thereby directing and redirecting the river and its channels throughout time.

The unconsolidated valley fill, present in the bedrock valley, ranges in thickness from approximately 70 to 120 feet in the study area. The thickness of the valley fill in the region of the study area is depicted in Figure 5. A cross section of the valley fill in the vicinity of the study area is presented in Figure 6.

The valley fill deposits are typically comprised of two main formations which may reach as deep as 120 feet in the site area. The Cahokia, the uppermost formation, is comprised of predominantly silt,

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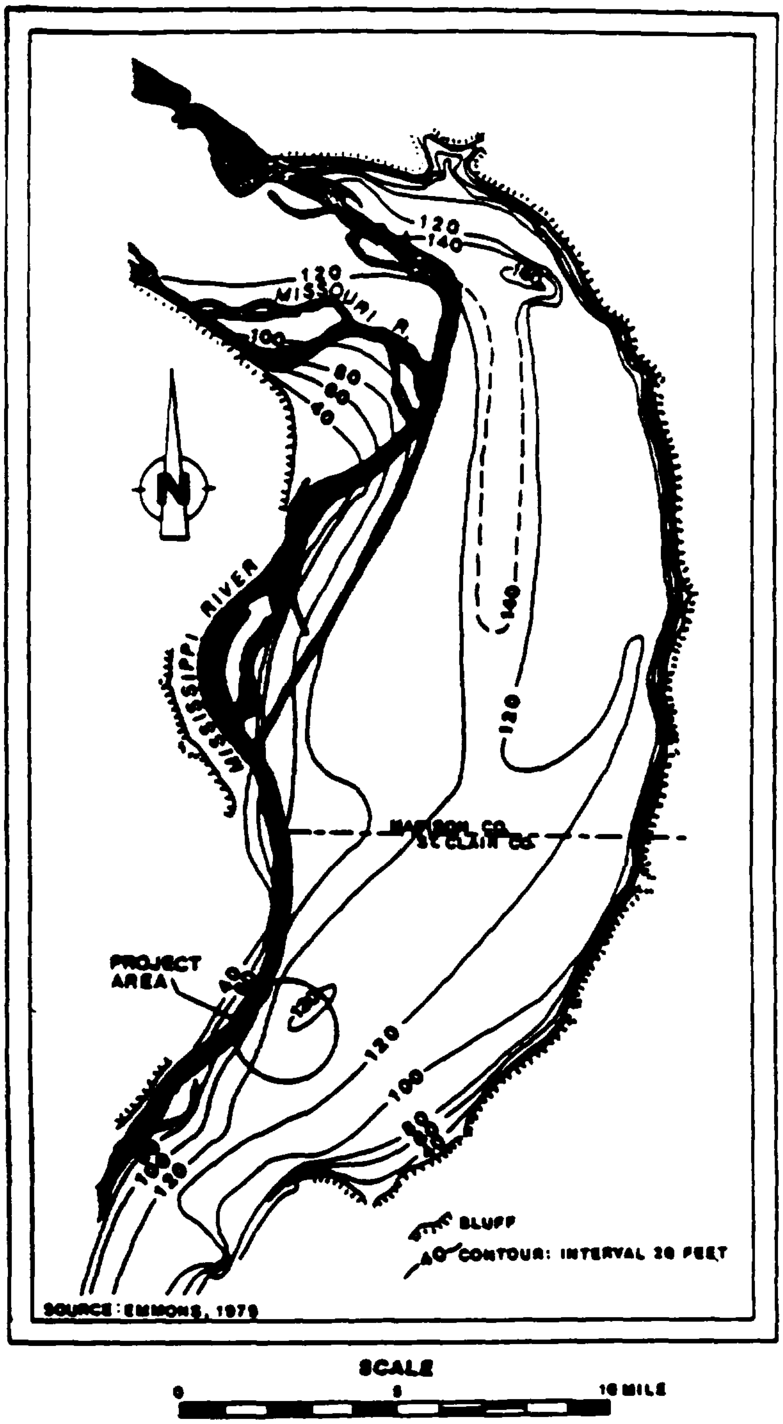

FIGURE 5
THICKNESS OF THE UNCONSOLIDATED VALLEY FILL IN THE DEAD CREEK STUDY AREA

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clay, and fine sand deposits generally indicative of an aggrading environment. These deposits were laid down as flood events of the Mississippi River, eolian activity, bank slumping, erosion, and/or slugs of material deposited directly by tributary streams. This formation has been frequently reworked by the Mississippi River and typically consists of coarser material intertongued with finer grained deposits. As such, these deposits can be variable in thickness (ranging from 15 to 30 feet). Larger expressions of tributary deposits may form thicker alluvial fans where high energy streams dissipated and dropped their sediment load.

The second major formation of the floodplain setting is the Mackinaw Member of the Henry Formation. This formation underlies the Cahokia Alluvium, and is comprised of sand and gravel from glacial outwash.. Within the study area, this material rests directly on the bedrock surface and can be highly variable in thickness (70 to 100 feet) due to the fluvial processes which formed it. This formation typically contains portions which are complexly interbedded due to meandering of the river throughout history.

A third minor formation noted locally within the floodplain, but not discovered within the site investigation area, is the Peyton Colluvium. This material is comprised of fine grained silt (loess) and clay (till) which has slumped from upland areas and accumulated at the base of steep bluffs.

Immediately adjacent to the floodplain (and 3.5 to 5 miles east-south east of the sites) is an upland area marked by a steep (50 to 150 feet above surrounding terrain) bluff. Structurally, these upland areas are based unconformably on bedrock (which has not been eroded as deeply as the adjacent valley), and consists of 10 to 100 feet of uncolsolidated sediments of predominantly glacial origin. No upland formations exist in the study area; however, erosion and slumping of the upland has provided the parent material for the Cahokia Formation and Peyton Colluvium, which are found in the floodplain.

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valley erosional processes to the southwest of the study area, while maintaining these same formations at a deeper elevation to the northeast of the study area.

Hydrology

The description of the hydrology of the study area is divided into the surface drainage and groundwater discussions presented below.

Surface Drainage

The Mississippi River extends far to the north and south of the site area and drains the American Bottoms and the tributary upland area. Although the Mississippi River floodplain is subject to periodic inundation by excess water runoff, most of the area is protected from massive regional flooding by a complex series of levees and other flood control structures. This condition partially adds to local small scale flooding problems since precipitation is trapped behind the flood control structures where drainage is typically poor. Dead Creek itself provides drainage for a portion of the American Bottoms, and ultimately discharges to the Mississippi River via the Prairie DuPont Floodway and Cahokia Chute. Fenneman (1909) has suggested that Dead Creek may at one time have been a southward extension of Cahokia Creek. Excessive siltation, realignment of surface drainage, or stream piracy may have redirected Cahokia Creek to its present channel, thus cutting off Dead Creek from the original source water.

Major surface drainage in the area is also provided by Cahokia Creek (to the north) and the Old Prairie DuPont Creek (to the south). Both of these creeks channel surface water directly into the Mississippi River. Significant additional secondary drainage within the site area and floodplain is provided by an extensive system of storm drains, pumping stations, and ditches, which were constructed or modified from existing natural drainage features for this purpose.

depressed below ground surface except where affected by surface structure or well pumpage. Groundwater levels are affected by flood stages of the Mississippi River, and undergo water-level fluctuations as a result of seasonal weather patterns. In areas remote from major pumping centers, water levels generally recede in late spring, summer and early fall, when discharge from the groundwater reservoir by evapotranspiration, groundwater run-off to streams, and pumping from wells is greater than recharge. Recovery of water levels generally occurs in the early winter when conditions are favorable for infiltration of rainfall to the water table. Water level recovery is especially pronounced during the spring when the groundwater reservoir receives most of its annual recharge. Water levels are generally highest in May and lowest in December. Water levels remote from major pumping centers have a seasonal fluctuation ranging from 1 to 13 feet, with an average fluctuation of about 4 feet.

Based upon the surface drainage system for the region in 1900, R.J. Schicht (Illinois State Water Survey, 1965) estimated the piezometric surface prior to heavy development in the area. Groundwater elevation was estimated to be about 420 feet near the bluffs to about 400 feet near the Mississippi River. The piezometric surface had an average slope of about 3 feet per mile and ranged from 6 feet per mile in the Alton area to the north, to one foot per mile in the Dupo area to the south. The slope of the piezometric surface was greatest near the bluffs and flatest near the Mississippi River. Groundwater movement was generally directed to the west and south toward the Mississippi River and other streams and lakes.

Groundwater movement in the shallow deposits throughout the study area generally follow the land surface topography, with lateral movement toward local discharge zones (wells and small streams), and some movement into the deeper unconsolidated aquifers. Groundwater in the deeper unconsolidated deposits generally follows the bedrock surface. Accordingly, groundwater generally flows downstream through the sand and gravel aquifers in much the same direction as the original streamflow, but at a much slower rate.

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recharge of the water table only captures a portion of the annual precipitation. A major portion of the precipitation runs-off to streams or is lost by the evapotransporation process before it reaches the aquifer. Nevertheless, precipitation is probably the most important recharge source for the study area as a whole. The amount of surface recharge that reaches the saturation zone depends upon many factors, including the character of the soil and other materials above the water table, the topography, vegetal cover, land use, soil moisture, depth to the water table, the intensity and seasonal distribution of precipitation, and temperature. Because of the low relief and limited runoff in the study area, and because the upper silt and clay fill is not so impermeable as to prevent appreciable recharge, most of the precipitation either evaporates or seeps into the soil. Because of the extensive flood-control network in the area, recharge from floodwaters provides a limited input to the area. Based upon a modified form of the Darcy equation, R.J. Schicht (1965) calculated the average rate of surface recharge to be about 371,000 gpd/sq. mi. for the study area.

Regional groundwater flow components to the west and south provide subsurface recharge to the study area. Schicht similarly estimated that the average recharge from subsurface flow of water from the eastern bluff boundary is 329,000 gpd/mi.

The lowering of the water table as a result of groundwater withdrawals in the study area has, in the past, established a hydraulic gradient from the Mississippi River toward the pumping centers. This resulted in water percolation through the river bed and into the aquifer, producing induced infiltration recharge. Schicht estimated the 1961 induced infiltration recharge volume for the study area to be approximately 18.5 million gpd, or roughly 58%, of the 31.9 million gpd total being withdrawn. Water withdrawal data from 1980 for the study area and areas to the north indicate that total withdrawals amount to only 3.9 million gpd as compared to more than 42 million gpd in 1961. Accordingly, for the study area, the amount of current induced infiltration from the Mississippi is

III. SITE SPECIFIC DESCRIPTIONS

SITE G. ABANDONED LANDFILL

Site Description

Site G is a former subsurface/surface disposal area which occupies approximately 4.5 acres in Sauget, Illinois. The site is bordered on the north by Queeny Avenue; on the east by Dead Creek; on the south by a cultivated field; and on the west by Wiese Engineering Company property.

The surface of Site G is littered with demolition debris and metal wastes. Several small pits have been observed in the northeast and east-central portions of the site. Oily and tar-like wastes, along with scattered corroded drums, are found in these areas. Additionally, 20-30 deteriorated drums are scattered along a ridge running east-west, near the southern perimeter of the site. The western portion of Site G is marked by a mounded area with several corroded drums protruding at the surface. A large depression is found immediately south of the mounded area. This depression receives surface runoff from a sizable area within the site. Also, exposed debris is present over most of the site. In areas where wastes are not exposed, flyash and cinder material has been used as cover.

Site History and Previous Investigations

Examination of historical aerial photographs indicates excavation at Site G began sometime prior to 1950 and disposal operations were initiated shortly thereafter. No information is available concerning owners or operators for Site G at the time disposal was occurring. The photographs suggest disposal activities at the site continued until the early 1970s. Presently, Site G is inactive, although recent observations suggest that random dumping of various non-chemical wastes continues.

Site G was previously studied by the Illinois EPA in 1980 and 1981 as

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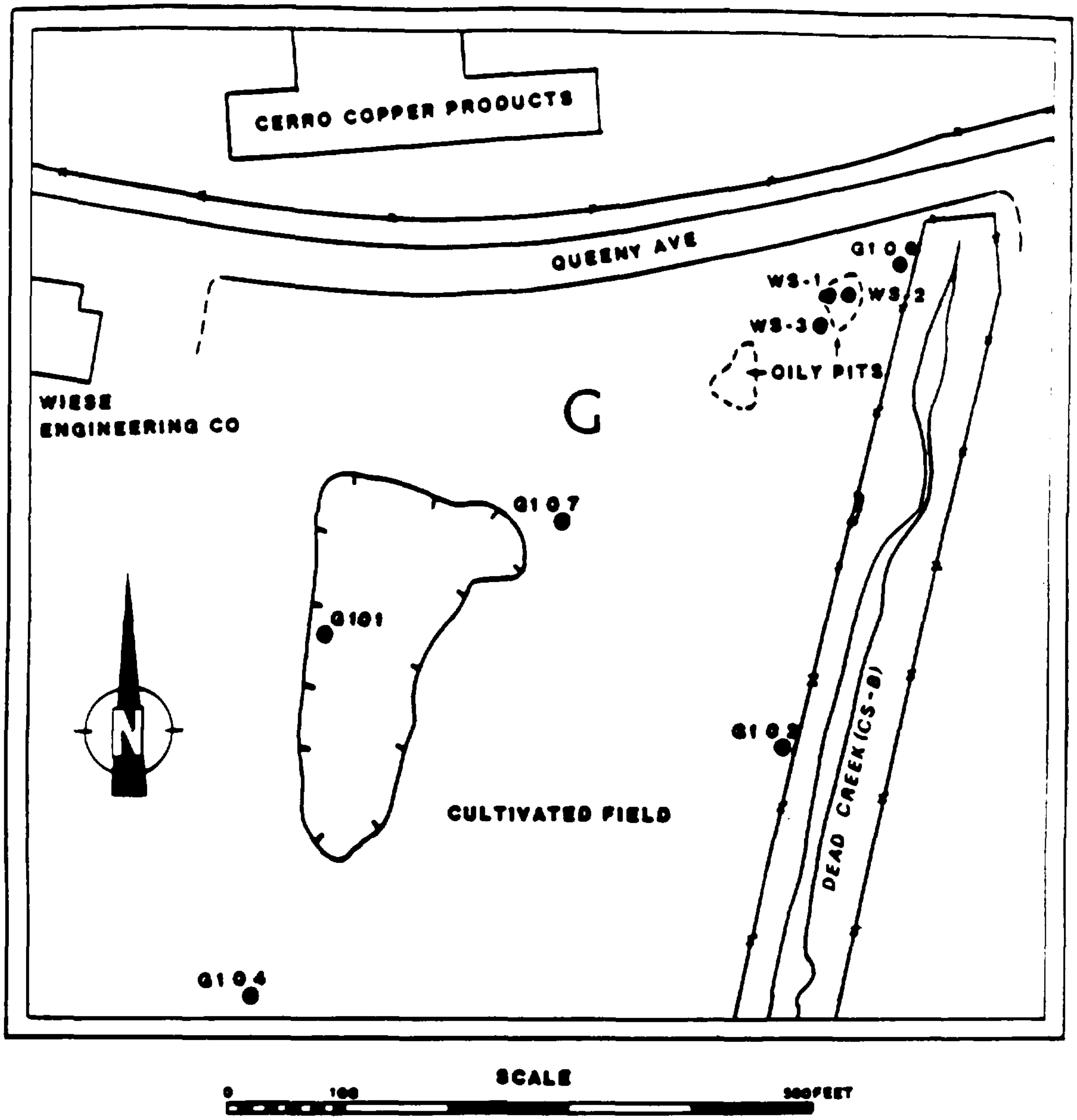

LEGEND

G106 IEPA MONITORING WELL

WS-1 IEPA WASTE SAMPLING LOCATION

FIGURE G-1
DEAD CREEK SITE AREA G WITH SAMPLE LOCATIONS

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at Site G from a pit in the northeast corner. Analyses of these samples are presented in Table G-2. Elevated levels of heavy metals were found in all samples, as were various organic contaminants. PCBs were detected in sample WS-3, but not in the other two samples. Sample WS-1 showed the highest degree of organic contamination. Organics detected in this sample include dimethyl phenanthrene, phenyl indene, pyrene, trimethyl phenanthrene, and aliphatic hydrocarbons.

Data from additional samples taken adjacent to Site G in Dead Creek are addressed in the narrative for Creek Sector B. Site G may be a source of contamination in Dead Creek; however, since the hydrology in the area is not well-defined, this cannot presently be determined.

A geophysical investigation, including flux-gate magnetometry and electromagnetics (EM), was completed at Site G in December, 1985 as part of the Dead Creek RI/FS project. A survey grid with dimensions of 440 by 600 feet was laid out using a compass and tape measure. Because of the large amount of scrap metal scattered about the surface of Site G, instruments were calibrated in off-site areas. The magnetometer survey was subcontracted to Technos, Inc. of Miami, Florida.

The magnetometer survey at Site G showed that a major magnetic anomaly covers most of the northern portion of the site. Several smaller anomalies were found to the north of the large depression in the southwest corner of Site G. Survey lines run south of the fill area in a cultivated field showed no magnetic anomalies above background conditions. The mounds in the northwest corner of the site showed smaller anomalies at the surface and larger anomalies for deeper readings, indicating significant quantities of buried metals.

An EM survey was done using the same grid as for the magnetometer investigation. Shallow soundings indicated three areas showing relatively high intensity anomalies. These include a 50 feet by 20 feet area in the northeast corner, a 150 feet by 100 feet area in the east-central portion, and the entire mounded area along the west perimeter of the site. Deep soundings (approximately 10 to 15 meters in depth) indicated a significant anomaly covers most of the northern portion of the site. Three negative anomalies were recorded in the center of the fill area, possibly indicating higher, off-scale instrument readings or the presence of significant quantities non-conductive material such as concrete. The EM survey also showed anomalies trending off-site in the northwest corner, indicating the possibility that the actual filled area extends north under Queeny Avenue.

Data Assessment and Recommendations

Activities proposed at Site G for the Dead Creek Project include collecting 10 subsurface and 40 surface soil samples, and water samples from IEPA wells located on or near the site. A soil gas monitoring survey is also scheduled for Site G, and will be conducted in conjunction with ambient air monitoring at the site. Additional investigation is necessary to adequately characterize the site and to provide an adequate data base for conducting the feasibility study. Existing monitoring wells in the vicinity of the site need to be refurbished prior to sampling. Additional wells need to be installed around the site to determine if Site G is contributing to groundwater pollution in the area. Additional borings and subsurface sampling (alternatively excavation of test pits and sampling) in anomalous areas encountered during the geophysical study would be needed to provide additional information concerning depth of fill, waste characteristics, and past operation. This additional information will allow more specific evaluation of remedial alternatives. The hydrology of Site G in relation to Dead Creek also needs to be assessed to determine if the site is a source of pollution observed in the creek. This assessment would include collecting the following data: (1) Ground water elevations from a minimum of three locations on each side of the creek, (2) Surface water and creek bed elevations from three locations in the creek, and (3) Infiltration rates for the

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SITE H. ROGER'S CARTAGE PROPERTY

Site Description

Site H is a former disposal area covering approximately five acres in Sauget, Illinois. The site is located immediately southwest of the intersection of Queeny Avenue and Falling Springs Road. Presently, Site H is an open field which has been covered, vegetated, and graded. Several depression areas, capable of retaining rain water, are also evident. Surface drainage is generally to the west; although certain localized drainage is toward the aforementioned depressions.

Site History and Previous Investigations

A review of historical aerial photographs indicates that Site H was initially used as a disposal area sometime around 1940. Monsanto Company submitted a "Notification of Hazardous Waste Site Form" to the U.S. EPA in 1981, indicating below-ground drum disposal of organics, inorganics, and solvents. The notification listed the site name as Sauget Monsanto Illinois Landfill, and indicated that waste disposal continued until 1957. Site H is presently owned by James Tolbird of Roger's Cartage Company. Photographs suggest the site initially operated as a sand and gravel borrow pit prior to disposal activities. The southern half of Site I operated contiguously with Site H, and the properties were subsequently separated by the construction of Queeny Avenue.

Previous investigation of Site H is limited to review of historical photographs and the installation of one monitoring well downgradient from the site. This well, G110, was sampled in 1980 and 1981 as part of IEPAs hydrogeological investigation. Analytical data for well G110 is shown in Tables B-6, B-7, and B-8, presented in the Creek Sector B portion of this report. Contaminants detected in G110 include PCBs, chlorophenol, cyclohexanone, arsenic, copper, and nickel.

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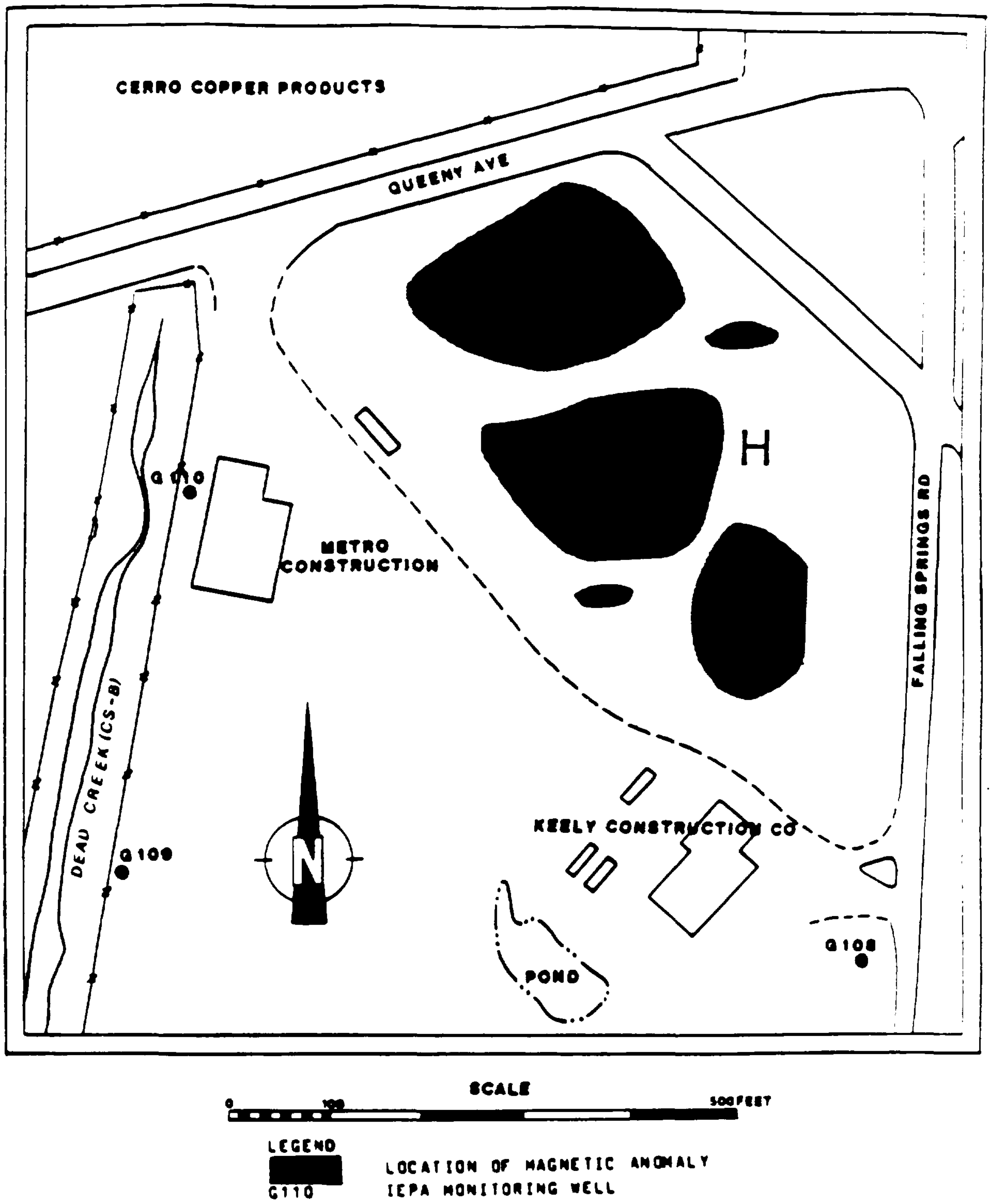

FIGURE H-1
DEAD CREEK SITE AREA H WITH MAGNETIC ANOMALIES

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SITE I AND CREEK SECTOR A - CERRO COPPER PRODUCTS

Site Description

Site I is an operating copper refining and tube manufacturing facility covering approximately 55 acres in Sauget, Illinois. The areas of interest for the Dead Creek Project at this facility include a former sand and gravel pit which was subsequently filled with unknown wastes, and a holding pond (Creek Sector A) which formerly served as head waters for Dead Creek. The Cerro Copper Products property is bordered on the north by the Alton and Southern Railroad; on the west by Illinois Route 3; on the south by Queeny Avenue; and on the east by Falling Springs Road. The areas to be investigated encompass roughly the eastern one-third of the property. Presently, the former gravel pit/fill area is covered and graded, and is used for equipment storage.

Site History and Previous Investigations

Cerro DePasco Corporation of New York purchased the existing plant and property west of Dead Creek in 1957 from the Lewin-Mathes Corporation. Cerro Copper subsequently added property east of the creek to their holdings in 1967. Examination of historical aerial photographs indicate subsurface disposal at Site I was discontinued sometime between the years 1955-1962. These photographs also show that Site I and Site H, which is located across Queeny Avenue to the south, constitute one large subsurface disposal area. Monsanto company submitted a "Notification of Hazardous Waste Site" form for this landfill (Sauget Monsanto Illinois Landfill), indicating disposal of organics, inorganics, and solvents in drums. The years of operation listed on the notification are "unknown to 1957." Historical photographs suggest activity at the site began prior to 1937.

Creek Sector A reportedly received discharges from Monsanto and other companies prior to 1970. In the early 1970's, the culvert

TABLE IA-1: ANALYSIS OF WATER SAMPLES FROM CREEK SECTOR A (COLLECTED BY IEPA)

PARAMETERS	SAMPLE DATE AND LOCATION			
	11/26/80		1/26/81	
	5503	5504	5501	5502
Alkalinity	127	110		
Ammonia	0.2	1.0		
Arsenic	0.058	0.025		
Barium	1.2	0.7		
BOD-5	630	158		
Boron	0.2	0.3		
Cadmium	0.36	0.19		
COD		1190		
Chloride	33	36		
Chromium (Total)	0.61	0.21		
Copper	4.5	3.6		
Cyanide	.01	.01		
Fluoride	0.4	0.7		
Hardness	227	260		
Iron	58	28		
Lead	6.6	2.8		
Magnesium	35.8	28.7		
Manganese	1.0	0.67		
Mercury	0.0016	0.0016		
Nickel	4.2	3.3		
Nitrate-Nitrite	1.4	1.7		
pH	6.9	7.0		
Phenols	0.02	0.035		
Phosphorus	1.9	3.4		
Potassium	4.3	6.2		
R.O.E.	361	407		
Selenium	0.002			
Silver	0.24	0.14		
Sodium	19.7	22.4		
Sulfate	90	130		
Zinc	30	17		
PCB (ppb)	22	28	2.0	-
Aliphatic hydrocarbons (ppb)	23,000			

NOTES: All results in ppm unless otherwise noted
Blanks indicate that parameter was not analyzed
\- Indicates below detection limits

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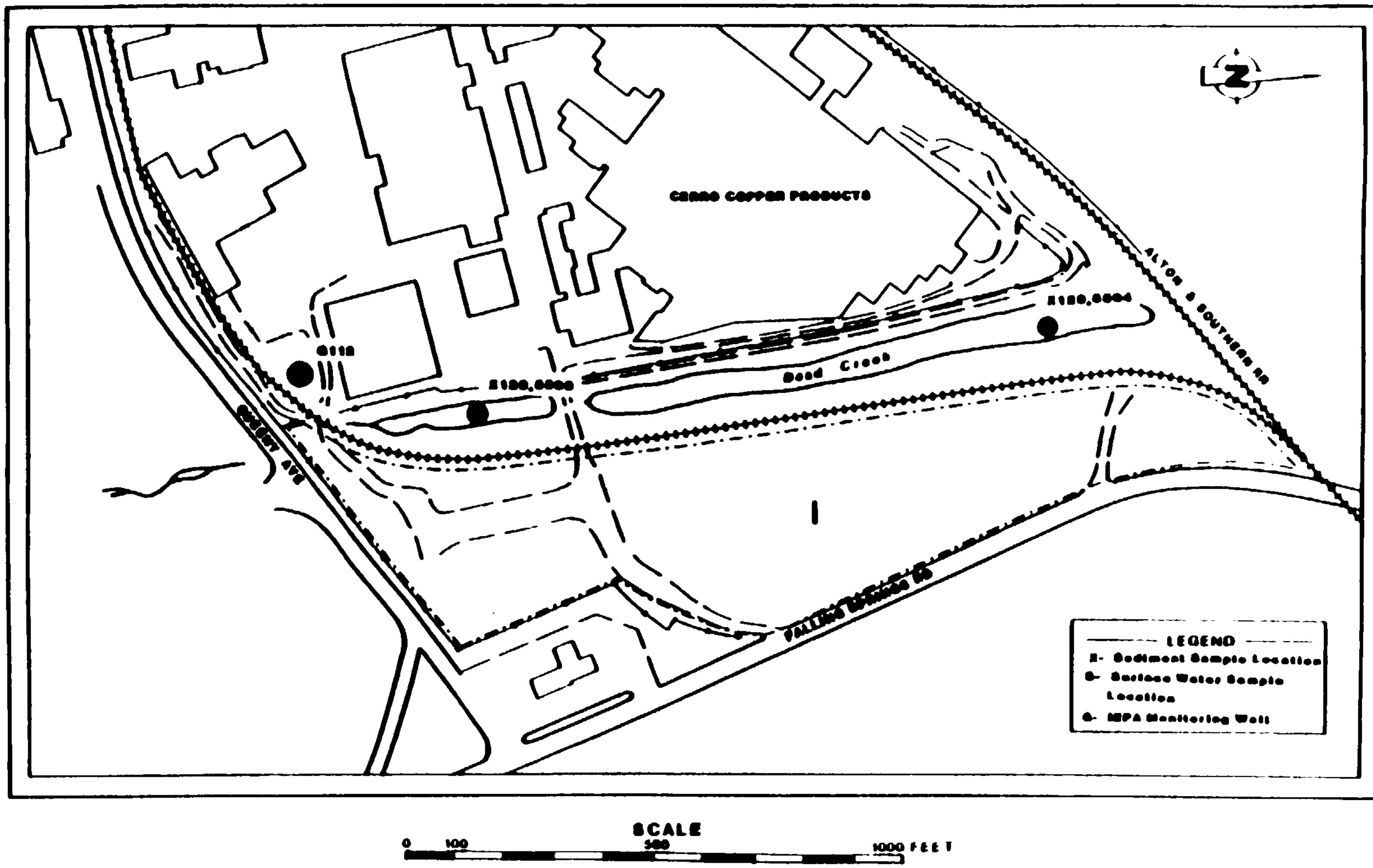

FIGURE IA-1
DEAD CREEK SITE AREA I AND CREEK SECTOR A WITH SAMPLING LOCATIONS

SITE J. STERLING STEEL FOUNDRY

Site Description

Site J consists of two pits and a surface disposal area utilized by an active steel foundry in the Village of Sauget, Illinois. The site is bordered on the north by the Alton and Southern Railroad; on the west by Monsanto Road; on the south by Little Avenue, and on the east by a Mobil Oil Tank Farm. The surface disposal area is defined by a triangular portion of the property to the northeast of the plant buildings. Generally, surface drainage in this area is directed toward a ditch along the northern perimeter. However, several scattered depression areas are also evident. Two unlined pits and one concrete-lined surface impoundment were observed at Site J, along with an incinerator which is no longer in use (Figure J-1).

Site History and Previous Investigations

The pit located southeast of the plant building was excavated approximately 30 years ago, based on a review of historical aerial photographs. According to the site operator, it was a borrow pit for road construction fill. The pit was subsequently filled with scrap metal, demolition debris, and casting sand. No evidence has been found suggesting disposal of hazardous materials in the borrow pit. The other unlined pit, located north of the plant building, was excavated in approximately 1950 for the purpose of collecting and settling baghouse dust from furnaces in the foundry. The dust is blown into this pit through underground piping, thus reducing the chance for off-site migration of airborne particulates. The adjacent concrete impoundment has two aerators, used to cool water from the furnaces and compressors.

A small incinerator is situated immediately west of the former borrow pit at Site J (Figure J-1). It has a stack approximately 15-18 feet in height, and was used solely to burn trash and empty bentonite sacks, according to the plant operator. The incinerator was operated

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for 10-12 years following its installation in 1970.

The surface disposal area covers approximately six acres to the northeast of the plant buildings. Sometime in the mid-1970's, Sterling Steel began to use this area for disposal of spent casting sand, slag, scrap steel, and construction debris. No initial excavation was done in this area prior to disposal activities, other than installing a drainage ditch along the northern perimeter. The area is periodically graded, although several depressional areas are evident. Several corroded drums, apparently containing only casting sand and slag, were also observed during a recent visit to the site.

R. O. Shive and Claude Harrell began operations at Sterling Steel Castings Company at its present location in 1922. In 1982, St. Louis Steel Company purchased the facility, and the name was changed to Sterling Steel Foundry, Inc. Raw materials used in Sterling's casting operations included manganese, chromium, nickel, the molybdenum, silicon, bentonite, and water. Water is circulated from furnaces and compressors to the aerated holding pond, and wastewater is directed to the Sauget Treatment Plant.

Site J has not been previously investigated by IEPA. The site was identified by inspection of historical photographs, which indicate possible disposal in the sand pits.

The original scope of work for the Dead Creek Project, as stipulated in the RFP, called for geophysical investigations at Site J to determine potential areas of drum disposal. Based on background review and visual observation, it was determined that geophysical surveys could not adequately define such locations in the originally proposed surface disposal area. This is due to the high metal content of the wastes in the area (casting sand, slag, scrap steel, steel shot), which would result in the entire site appearing as one large anomaly, thereby making it impossible to differentiate drums from other wastes.

CER 051541

SITE K. FORMER SAND PIT

Site Description

Site K is the location of a former sand pit for which no file information could be located. The site is located north of a residential area on Queeny Avenue, and east of Falling Springs Road in Sauget, Illinois (Figure K-1). Site K covers approximately six acres, and presently the property is unoccupied. Several trucks with the name M-T-S, Inc. (Sauget) on the doors were observed at the site during preliminary reconnaissance, but there was no activity at the property. Subsequent attempts to contact M-T-S, Inc. by telephone did not succeed. Several trailer homes and houses are located within 100 feet of the site. The pit, which constitutes Site K, has been filled and covered with soil and gravel, and the area has been graded to the surrounding topography.

Site History and Previous Investigation

Historical aerial photographs suggest possible waste disposal operations at Site K. Excavation at the site began sometime in the late 1940s. By 1955, the site was filled with unknown materials, and a vegetation cover had started to develop. No buildings were apparent at the site at the time of the initial excavation. After the excavation was filled, the site remained unchanged until at least 1968. Photographs from 1973 again show an excavation, somewhat larger than the first one, in the same location at Site K. This pit contained water, as seen in photographs from 1973 and 1974, and a building had been erected at the site sometime prior to 1973. No information has been located concerning operations at the site during this time period. The second excavation was filled with unknown materials by 1979, and the site has apparently remained generally unchanged since that time.

Previous investigation of Site K has been limited to a review of the historical photographs. No field investigations have been conducted at the site.

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Data Assessment and Recommendations

No sampling and/or analytical data has been developed to date for Site K. Since other sand pits/disposal operations in the area have shown significant contamination, it is entirely possible that the disposal of hazardous materials did occur at this site. Field activities scheduled for Site K consists of collecting three subsurface soil samples and conducting soil gas and ambient air surveys. This sampling should be adequate to determine the presence of wastes and also indicate if further investigation is necessary. If contamination is detected, additional attempts should be made to locate information concerning past operations at the site. Additional subsurface soil sampling and installation and sampling of groundwater monitoring wells should then be carried out. If contamination is detected, this added investigation would be essential in order to complete feasibility study activities. In addition, depending upon subsurface conditions identified, a geophysical investigation may be of value to delineate pit boundaries as well as determine the presence of subsurface drum disposal.

CER 051543

SITE L - OLD WAGGONER COMPANY IMPOUNDMENT

Site Description

Site L is the location of a former surface impoundment used by the Harold Waggoner Company to dispose of wash water from a truck cleaning operation. The impoundment was situated approximately 250 feet south of the present Metro Construction Company building, and approximately 125 feet east of Dead Creek (Figure L-1). The site is now covered with black cinders, and is used by Metro Construction Company for equipment storage. Several rows of heavy equipment are presently stored in the immediate area of the former impoundment. This equipment should be moved prior to any field activities.

Site History and Previous Investigations

Waggoner Company, owned and operated by Harold Waggoner, specialized in hauling industrial wastes for companies in the St. Louis/Metro East area. Harold Waggoner operated the company from 1964 to 1974, when he sold the operation to Ruan Trucking Company. Prior to 1971, Wagonner reportedly discharged wash water from truck cleaning operations directly to Dead Creek. In August 1971, the IEPA ordered Waggoner to cease discharging wastes to the creek. Subsequently, a pit was excavated for the purpose of storing wash waters, and the pit was used by Waggoner until 1974. Based on a review of historical photographs, the dimensions of this pit were determined to be roughly 70 feet by 150 feet. Ruan Trucking reportedly continued this practice of wash water storage until 1978. The property was then leased, and later purchased, by Tony Lechner of Metro Construction Company.

The IEPA calculated a rough estimate of the quantity of wash water disposed of in the impoundment between 1971 and 1978. This estimated volume, 164,000 gallons, is based on the assumption that Ruan Trucking operated at the same volume as Waggoner. The estimate is useful as a starting point for further calculations concerning

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expected leachate migration rates and plume characteristics in the ground water aquifer. It should be noted that the impoundment was not lined, and the base consisted of medium to coarse grained sands.

Site L was identified in the IEPA St. John Report as a source of both ground water and surface water contamination in the area. The IEPA study included collecting several soil/sediment samples and one groundwater sample from areas downgradient of Site L. Results from analyses of sediment samples are presented in Table B-1, located in the Creek Sector B portion of this report. Results from the analyses of groundwater samples from the monitoring well downgradient of Site L (well G109) are included in Tables B-6, B-7, and B-8 (Creek Sector B).

Monitoring well G109, located approximately 100 feet west of the former impoundment, was found to be the most polluted well during IEPA's preliminary investigation. Also, during the installation of G109, drillers became nauseous from fumes at the well location. Initial sampling conducted by IEPA on October 23, 1980 indicated the presence of chlorophenol, phenol, and cyclohexanone, along with relatively high levels of heavy metals (Table B-6). Analyses from subsequent sampling events did not show organic contaminants, other than phenol. Arsenic, cadmium, copper, nickel, and phosphorus were detected at quantities significantly above IEPA's water quality standards. Other IEPA monitoring wells adjacent to the creek showed concentrations of these contaminants at least an order of magnitude (10 times) less than those found in G109. No other likely sources of contamination are known to exist in the immediate area. In view of these points, it is likely that contaminants found in well G109 are attributable to the former disposal impoundment (Site L).

Surface soil samples collected in the vicinity of Site L during the IEPA study include X106, X120, and X125 (Figure L-1). Samples X106 and X125 were taken from the creek bed, and X120 was taken from surface soil east of the creek in the general vicinity of the

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Data Assessment and Recommendations

Investigations planned for Site L during the RI include subsurface soil sampling and soil gas monitoring. Ambient air monitoring will also be conducted as for all sites in the project.

Further activities necessary to provide adequate data for the feasibility study should include installation and sampling of 3 to 4 monitoring wells, and collecting additional subsurface soil samples. Subsurface soil sampling would be done in conjunction with well installation, and would provide additional data concerning migration of contaminants. The hydrology of the area also needs to be assessed to determine the interaction, if any, between the ground water and the creek.

Preliminary geophysical investigations and subsequent acquisition of historical aerial photographs indicate the likely presence of waste residues extending to the farmland to the south of Site L. Accordingly, additional surveys should be conducted south of the area initially surveyed. Additional geophysical investigations would allow better definition of the impoundment boundaries and also aid in delineating off-site migration of contaminants.

SITE M. HALL CONSTRUCTION PIT

Site Description

Site M is a sand pit excavated by the H.H. Hall Construction Company in the mid to late 1940's. The pit is located immediately east of Dead Creek, and approximately 300 feet north of Judith Lane in Cahokia, Illinois (Figure M-1). The dimensions of the pit are approximately 275 by 350 feet. Presently, Site M is enclosed by a chain link fence, which also surrounds Creek Sector B. A small residential area is located just east of the pit on Walnut Street, which earlier served as an access road to Site M. The pit was excavated prior to any residential development on this street. Observations suggest that the pit is apparently isolated from Dead Creek by an embankment; however, this embankment may not be continuous. Aerial photographs indicate that a small break in the southern part of the embankment may allow flow between the creek and Site M. This possibility is supported by past IEPA inspections indicating discoloration in the pit similar to that observed in Dead Creek.

Site History and Previous Investigations

No information is available on file concerning waste disposal activities at Site M. It is possible that disposal did occur, since access to the pit remained unrestricted until a snow fence was erected in 1980. From review of historical aerial photographs, it is evident that minor changes in the dimensions of the pit have occurred. This could be an indication of filling around the perimeter of the pit. IEPA and the Cahokia Health Department have received numerous complaints about Site M and the creek from residents in the area. These complaints address, for the most part, seepage of odoriferous water into basements and problems associated with well water used to water gardens and lawns.

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IEPA sampled several private wells in the area during the preliminary hydrogeological study conducted in 1980. In addition, one sample of basement seepage from a home on Walnut Street near Site M was collected. Analytical results of these samples are presented in Table B-9, located in the Creek Sector B portion of the report. The results show concentrations of copper, manganese, and phosphorus above the state's water quality standards in one or more wells as well as in the basement seepage sample.

In conjunction with the creek sampling done in 1980, IEPA collected sediment and water samples from Site M. Analytical data for these samples are presented in Table M-1. In general, the water samples showed no significant contamination, although water quality standards for copper, phosphorous, and zinc were exceeded. Trace levels of PCBs (0.9 to 4.4 ppb) were found in both samples. The sediment samples, however, did show fairly high levels of several contaminants, including cadmium, chromium, copper, lead, nickel, zinc, and PCBs. In general, the samples closer to the break in the embankment separating Site M from Dead Creek showed higher levels of contaminants than the other samples.

Because water levels in the pit were approximately two feet higher than those found in the closest monitoring wells, the IEPA study concluded that there is no hydrological connection between water in the pit and the ground water aquifer. This assessment may or may not be accurate.

Data Assessments and Recommendations

The IEPA study conducted in 1980 showed significant contamination at Site M and identified specific waste types present. Investigation of Site M for the Dead Creek Project includes collecting two surface water and three sediment samples. A soil gas survey and ambient air monitoring will also be conducted at Site M. This sampling program will not provide sufficient data to adequately evaluate remedial alternatives. Core samples should be collected from the bottom of the pit in order to determine the types of wastes present and the extent of vertical migration of contaminants that has occurred. In addition, several borings should be completed around the perimeter of the pit, including the embankment between the pit and the creek. It would also be necessary to verify that there is no hydrological connection between the water in the pit and the ground water aquifer. This would be best accomplished using continuous recording gauging stations at wells in the vicinity of the creek and at the pit. These activities would provide the information necessary to proceed with a viable remedial program.

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SITE N - H.H. HALL CONSTRUCTION CO.

Site Description

Site N is an operations and equipment storage facility for the H. H. Hall Construction Company of East St. Louis. The site is located in a residential/commercial neighborhood in the town of Cahokia, Illinois. Site N is bordered on the north by residential property along Judith Lane; on the west by Dead Creek; on the south by residential property along Edwards Street, and on the east by Falling Springs Road. The entire facility covers approximately 23 acres. Access to the site is restricted by a chain link fence.

Site History and Previous Investigation

Historical photographs indicate that a borrow pit existed at the facility which may have been used for waste disposal. The borrow pit, located in the southwest corner adjacent to Dead Creek, is roughly 4-5 acres in size (Figure N-1). No file information has been located concerning waste disposal at Site N. The pit has been filled and covered.

Historical photographs indicate that excavation at Site N began sometime prior to 1950. The presence of water in the pit was displayed in photographs from 1950, suggesting excavation into the Henry Formation aquifer. Hall Construction Company officials were recently contacted in an attempt to gather further information about the site. Apparently the pit was excavated in the late 1940's as a borrow pit for road construction materials. According to the officials contacted, concrete rubble and other demolition debris are the only wastes disposed of in the pit by Hall Construction. The area is presently covered with rubble and debris and is used only for equipment storage.

Although no analytical data has been developed for Site N, it should not be overlooked as a possible source of contamination in the area.

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The site is located adjacent to Creek Sector C of Dead Creek, which has shown elevated levels of several contaminants, including PCBs. At this time, it cannot be determined if the contamination in Creek Sector C is the result of flow from the heavily-contaminated Creek Sector B, or the result of other unknown sources. It is also not known if access to Site N has always been restricted. Accordingly, the possibility exists that other parties may have used the pit for disposal.

Data Assessment and Recommendations

No sampling or field investigation data is presently available for Site N. Field activities scheduled at Site N during the Dead Creek Project include collecting three surface and two subsurface soil samples. In addition, a soil gas survey and ambient air monitoring will be conducted at the site. These investigations should be adequate to characterize the types of wastes present. The results of this sampling should also indicate if further investigation of the site is warranted.

If contamination is identified at the site, additional subsurface soil sampling and installation and sampling of groundwater monitoring wells should be carried out. This added investigation would be essential to complete feasibility study activities. In addition, depending upon subsurface conditions identified, a geophysical investigation may be of value to delineate pit boundaries and determine the presence of subsurface drum disposal. The hydrology of the creek in relation to the site should also be assessed to determine the potential for discharge from the pit to the creek.

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SITE O - SAUGET WASTE WATER TREATMENT PLANT

Site Description

Site O is the Sauget Waste Water Treatment Plant and related property, located on Mobile Avenue in Sauget, Illinois. The property covers approximately 45 acres in a heavily industrialized area. The site consists of a series of four inactive sludge dewatering lagoons and a separate area of contamination. The former sludge lagoons cover approximately 20 acres to the south of the treatment plant buildings, and the identified contaminated area (3 acres) is located immediately west of the Sauget Waste Water Treatment Plant on the northwest corner of the property.

Site History and Previous Investigations

The Sauget Treatment Plant has been in operation in some form since approximately 1952. The plant primarily treats effluent from area industries, but also provides treatment for the entire Village of Sauget. Approximately ten million gallons per day (MGD) of waste water is treated at this facility, of which over 95 percent is from industrial sources. Area industries served by the Sauget Treatment Plant include Monsanto Chemical, Cerro Copper, Sterling Steel Foundry, Amax Zinc, Rogers Cartage, Edwin Cooper, and Midwest Rubber. Effluent from the treatment plant is directed to a National Pollutant Discharge Elimination System (NPDES) permitted discharge point in the Mississippi River.

The treatment plant has a long history of NPDES permit violations, for the most part due to the chemical quality of the plant effluent. Mercury, PCBs, and organic solvents have been detected at concentrations exceeding permit limits on several occasions. A USEPA study conducted in 1982 concluded that the treatment plant waste water contributed a substantial volume of priority, toxic pollutants annually to the Mississippi River. Since operations began, the plant has undergone several modifications and upgrades, increasing both

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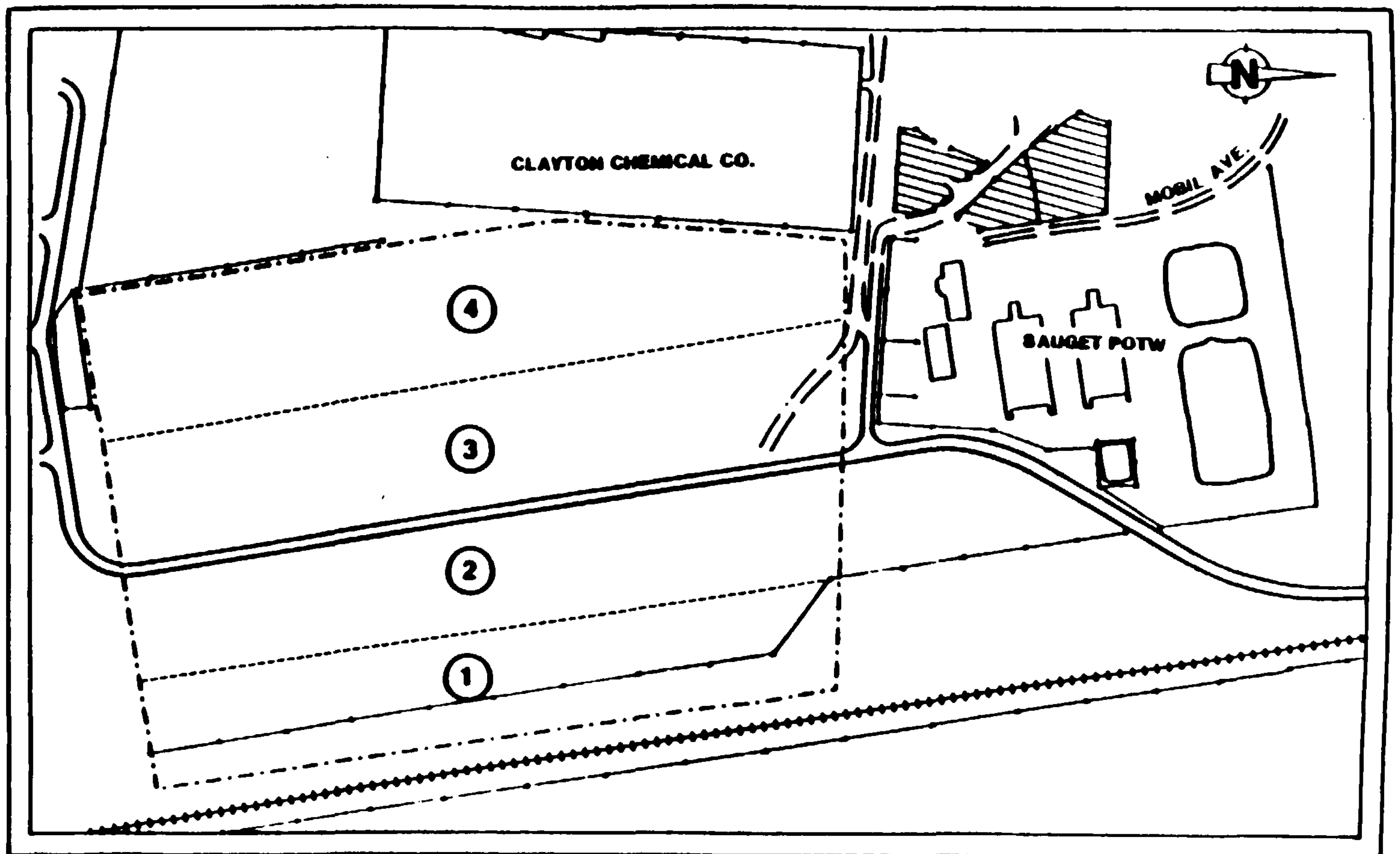
E000510



LEGEND

2 FORMER SLUDGE LAGOON

APPROXIMATE LAGOON BOUNDARY

AREA OF INDENTIFIED SOIL CONTAMINATION

SCALE

0 100 500 1000 FEET

FIGURE O-1

FORMER SLUDGE LAGOONS AND CONTAMINATED SOIL AREAS AT SITE O

TABLE O-1: IDENTIFIED ORGANIC COMPOUNDS IN SAMPLES FROM TRENCH EXCAVATION AT SITE O (COLLECTED JULY 20, 1984 BY RUSSELL AND AXON, INC.)[a]

SAMPLE LOCATIONS

PARAMETERS	SAMPLE 1	SAMPLE 2	BLANK
2,4-Dichlorophenol	50.1		
Pentachlorophenol	3,600	159	
2,4,6-Trichlorophenol	39.3		
Crysene	123	2.2	
Benzo-k-Fluoranthene	15.9	0.45	
Bis(2-Ethylhexyl) Phthalate	10.9		0.098
1,2-Chlorobenzene		12.2	
1,4-Dichlorobenzene		8.01	
Di-Butyl Phthalate		5.06	0.1
Phenanthrene	100	1.6	
Pyrene	102	2.1	
1,2,4-Trichlorobenzene	65.3	1.6	
PCBs	*	*	
Benzo(a)Pyrene	4.2	1.0	

NOTE: All results in ppm.
Blanks indicate compound not detected.
* Identified, but values cannot be verified.
a Analysis performed by Envirodyne Engineers, Inc. (EEI), St. Louis, MO.

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E000512

TABLE O-3: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE O. (SPLIT SAMPLES COLLECTED MARCH 12, 1983 BY IEPA AND EEI)

	PARAMETERS		
SAMPLE NO. (Depth)	TCDD - IEPA[a]	TCDD - EEI	COMMENTS
7A (0"- 6")			
7B (8" - 16")	1.8	44	
8A (0" - 6")	77	Interferences	
8B (6" - 12)	*	19	
8C (13" - 18")		37	
8D (18" - 25")		56	Duplicate
8D (18" - 25")			
9A (0" - 6")	1.3		
9B (6" - 12")	*		
9C (14" - 21")			
9D (22" - 28")	0.92		Control Sample
10A	12		Control Sample
10B	*	13	
11A (0" - 6")			
11B (G" - 18")	*		
12 (10" - 19")	*		
13A (0" - 7")			
13B (7" - 18")	13	13	
14 (0" - 6")	25	170	Composite of soil samples
15 (0" - 16")			
16 (0" - 18")			

NOTE: All results in ng/g (ppb).
Blanks indicate below detection limits.
* Sample not collected by IEPA.
a Hazelton Raltech, Inc. performed TCDD analysis for IEPA.

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Data Assessment and Recommendations

Based on the information outlined above, there is significant and widespread contamination in the area of the Sauget Treatment Plant. Additional information is available from Russell and Axon, Inc., and further attempts should be made to secure all data pertaining to chemical wastes in the area from this contractor. A signifcant amount of analytical data has been generated for the contaminated area west of the treatment plant. However, the horizontal and vertical extent of contamination has not been assessed. Similarly, very little data is available with respect to the former sludge lagoons which would be useful in proposing remedial alteratives.

The present scope of work for this project includes only collecting and cataloging all data pertaining to Site O. Wastes have been characterized in the area west of the treatment plant, and two major contaminants have been identified to a depth of 28 inches in this area. Data is also available from samples taken in the vicinity of the former sludge lagoons which provides an indication of possible waste types present in the lagoons. The approximate boundaries of the lagoons can be determined based on a review of historical aerial photographs. The data generated to date for Site O indicates that further field investigation is warranted. In order to define and specify remedial alternatives, the areas of surface and subsurface soil contamination need to be accurately defined. In addition, since the sludge lagoons are not lined, and may have been excavated into the Henry Formation aquifer, a strong possibility for ground water contamination exists.

For the former sludge lagoons, it is recommended that soil borings be completed into the lagoons to a depth sufficient to assess the vertical migration of contaminants from the lagoons. The borings should be located so as to provide intersecting cross sections for mapping purposes, and should cover the entire lagoon area. Samples should be composited for ten foot intervals for each boring and analyzed for all hazard substance list (HSL) compounds. These

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SITE P - SAUGET/MONSANTO LANDFILL

Site Description

Site P is an inactive, IEPA-permitted landfill covering approximately 20 acres in Sauget, Illinois (Figure P-1). The site is bordered on the west by the Illinois Central Gulf Railroad; on the south by Monsanto Avenue, and on the east by the Terminal Railroad Association railroad. The two railroads converge to delineate the north boundary. Generally, the geology at the site consists of silty sand, underlain by fine grained to silty clay, followed by fine to coarse grained sands down to the bedrock. Surface drainage is to the south-central portion of the site, which was not landfilled due to the presence of a potable water line in this area. A depression area is also found along the east perimeter, adjacent to the Terminal Railroad. Surface drainage will not leave the site due to the presence of railroad embankments along the perimeter and the depression in the central portion of the site.

Site History and Previous Investigations

Sauget and Company entered into a lease agreement with the Union Electric Company in St. Louis to operate a waste disposal facility in 1972. In January 1973, IEPA issued an operating permit to Sauget and Company to accept only non-chemical waste from Monsanto. Sauget and Company subsequently applied for, and was granted, a supplemental permit in 1974 which allowed acceptance of general waste and diatomaceous earth filter cake from Edwin Cooper, Inc. (now Ethyl Corp.). The IEPA began conducting routine inspections of the facility in 1974, at which time no violations were evident. In October 1975, an inspector observed a small amount of yellowish, tar-like liquid in an area adjacent to several crushed fiber drums which were labelled "Monsanto ACL-85, Chlorine Composition." Sauget and Company and Monsanto were subsequently notified of this permit violation, and the matter was not further addressed. The site was operated in general compliance until December 1977, when an

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inspection revealed the disposal of approximately 25 metal containers (12-15 gallon) full of phosphorus pentasulfide (P_2S_5), a flammable solid. Monsanto was required to excavate and remove all of this material from the site, and to discontinue disposal of any chemical wastes or packagings.

The IEPA became aware of another potential problem at this time, specifically the use of a Southern Railway slag pile for intermediate and final cover material. Analysis of this slag showed it to be unsuitable as cover due to its high permeability and heavy metal content. Cinders were also used as cover material at Site P, and are expected to pose the same problems as the slag; that is, increased surface water infiltration and the resulting potential for leaching heavy metals along with organic wastes into the groundwater.

State inspections in 1978 and 1979 indicated unpermitted disposal of Monsanto ACL filter residues and packagings. The composition of this material is not known. According to the site operator at that time, this material would occasionally ignite when in contact with the filter cake waste from Edwin Cooper.

An Illinois American Water Company distribution main was discovered in 1980 during preparatory excavation on the southern portion of the site. The south one-third of the property was purchased from Illinois Central Gulf in 1971 by Paul Sauget. Following discovery of the water line, Site Plans and permits were modified to include no waste disposal within 100 feet of the line.

Review of available IEPA records indicates that the Edwin Cooper filter cake is the only industrial process waste that was reported to have been disposed of at Site P. Records indicate that approximately 117,000 cubic yards of this material was accepted. The filter cake was classified as non-hazardous on special waste authorization permit number 7400017, based on EP toxicity results submitted in 1973. Additional analytical data is available for a filter cake composite sample from Edwin Cooper in 1979 which indicates elevated levels of

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SITE Q - SAUGET/SAUGET LANDFILL

Site Description

Site Q is the Sauget/Sauget Landfill, an inactive waste disposal facility operated by Sauget and Company between the years 1966 and 1973. The site is approximately 90 acres in size, including a southern extension, as delineated by the Alton and Southern Railroad tracks (Figure Q-1). The site is located on east bank of the Mississippi River and is also on the river side of a U.S. Army Corps of Engineers flood control levee. Site Q is also situated immediately east of Site R, commonly known at Sauget Toxic Dump, a chemical waste disposal facility owned by the Monsanto Chemical Company.

Site Q was operated without a permit from IEPA, although registration with the Illinois Department of Public Health was obtained for the north site in 1967, prior to the formation of the IEPA. The site is presently covered with black cinders, which is an unsuitable cover material due to its high permeability. Site Q is presently owned by the Riverport Terminal and Fleeting Company, and the property is leased to the Pillsbury Company. Pillsbury operates a coal unloading facility at the site.

Site History and Previous Investgations

Disposal operations at Site Q began in approximately 1966 in the northernmost portion of the property. A Union Electric Company flyash pond existed at the site in an area immediately south of Monsanto's chemical dump. IEPA inspections in the early 1970's documented several violations of the Illinois Environmental Protection Act, including open burning, use of unsuitable cover materials (cinders and flyash), and acceptance of liquid chemical wastes. Septic tank pumpings were also accepted at the site from approximately 1968 to 1972, and were apparently co-disposed with general municipal refuse.

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in April, 1971, a complaint was filed by IEPA against Sauget and Company for the violations mentioned above. The company was ordered to cease and desist open burning, accepting liquid chemical wastes, open dumping, and use of cinders and flyash as cover material. In July, 1972, a smoldering underground fire was observed by IEPA inspectors at the site. The fire continued to smolder until October, 1972 despite repeated attempts to extinguish it. Underground fires were a continuing problem, as documented by later IEPA inspection reports. In the spring of 1973, flood waters from the Mississippi River inundated Site Q. This condition persisted into the fall, and operations at the site were discontinued. Exposed refuse was observed being carried downstream in the river at that time.

Sauget and Company filed a permit application to IEPA in 1972 for a proposed extension to the existing landfill. The proposed extension was located south of the Alton and Southern railroad tracks, and will be referred to as the south site. IEPA denied issuance of a permit for this extension several times, as Sauget and Company had filed repeated applications. Although approval of the south site was never issued, disposal operations continued in this area.

In the early 1970's, IEPA collected several samples from Site Q. Approximate sample locations are shown in Figure Q-1. Analytical data for samples collected from ponded water, leachate seeps, and ground water are provided in Table Q-1. The first set of samples, collected in October, 1972, consisted of one sample from ponded water, and one leachate sample. The results for these samples show the presence of several metals, including copper, iron, lead, mercury, and zinc. Ground water samples were collected in January, 1973 from two monitoring wells at Site Q. Information regarding construction details for these wells has not been located. Sample GW-1 showed trace levels of cadmium, silver, and phenols, while GW-2 showed very little evidence of contamination. Samples were again collected by IEPA from ponded water at Site Q on two occasions in April, 1973. Analytical results showed low levels of boron, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc in sample

P-2 and/or P-3. Although the data from samples collected in the early 1970's showed the presence of several contaminants, most notably phenol and heavy metals, no conclusive evidence of contamination at Site Q was obtained.

IEPA collected samples from leachate seeps along the Mississippi River in October, 1981 and again in September, 1983. The locations of these samples are shown in Figure Q-1, and analytical results are presented in Table Q-2. Data for the 1981 samples shows elevated concentrations of arsenic, chromium, copper, lead, managanese, and phosphorus in both samples. Additionally, low levels of phenols and PCBs were detected in the samples. The samples collected in September, 1983 show very similar results. Heavy metals and PCBs were again detected at concentrations very close to those seen in the earlier samples.

The cinders and flyash used as cover materials at Site Q have been the subject of numerous investigations and complaints by IEPA. In addition, the depth of final cover has been deemed inadequate, and enforcement action is pending on this matter. The Illinois Pollution Control Board Case Number 77-84 was filed against Sauget and Company and Paul Sauget in May, 1977. As a result of the findings in this case, a monetary penalty was invoked, and Sauget and Company was ordered to place two feet of suitable cover material on the entire site by February, 1981. Sauget's failure to comply with these orders led the Illinois Attorney General's office to file a similar case. Site Q has been a chronic enforcement problem, and recently Paul Sauget was found in contempt of court for failure to comply with court orders.

Laboratory tests run on the cinders and flyash indicate permeability values in the range of 9×10^{-3} centimeters per second, which is considered unsuitable by IEPA. In addition, metals analysis of the cover material showed unacceptably high levels of arsenic, copper, lead, and zinc. In 1972, IEPA collected samples from stockpiled flyash at Site Q, and ran leach tests for inorganic constituents.

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Samples were taken from piles estimated to be 5 years old, 1 year old, and fresh material to determine the types and quantities of contaminants being leached from this material at the site. Analytical data for these samples are shown in Table Q-3. Analysis of the first set of samples (August, 1972) shows a distinct trend of the more soluble compounds, such as calcium, sodium and potassium, being leached from the fresh ash. However, the second set of samples, collected in October 1972, does not show a similar trend. The reasons for this discrepancy are not clear. The data in Table Q-3 also shows that significant quantities of metals are contained in the ash, particularly for the material estimated to be five years old.

IEPA's Notices of Violations concerning disposal of chemical wastes at Site Q in early inspections are supported by more recent information. Notification of Hazardous Waste Site Forms were submitted to USEPA from three companies for this site. These notifications indicate disposal of organics, inorganics, solvents, pesticides, paint sludges, and unknown wastes at the site. In May, 1980 workers uncovered buried drums and unknown wastes while excavating for construction of a railroad spur on the property. Workers observed a haze or smoke rising from the material after it was uncovered, suggesting corrosive and/or reactive properties.

In November, 1985, IEPA received a sketch from a reporter for a St. Louis newspaper indicating the location of buried drums containing PCBs. The reporter's source of this information is not known, nor has the information been verified to date.

As a result of the May, 1980 incident in which buried drums were unearthed, USEPA tasked its FIT contractor (Ecology and Environment, Inc.) to perform a detailed study to determine the extent of chemical contamination at Site Q. The study included a systematic geophysical investigation using EM, magnetometry, and ground penetrating radar (GPR), followed by a drilling and sampling program to investigate possible subsurface contamination. The investigation was limited

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to the northern portion of the site which amounts to approximately 25 percent of the site area.

Technos, Inc. of Miami, Florida was contracted to perform the geophysical investigation. This investigation was completed in June 1983. Results of the geophysical investigation identified the probable limits of landfilling and burial zones of relatively large concentrations of iron bearing materials such as drums or car bodies. These iron bearing zones were found in several distinct locations in the north-central and western portions of the study area.

Following the geophysical investigation, a drilling/sampling program was conducted to determine if subsurface soils were contaminated. The program consisted of drilling 18 test borings through the landfill, and collecting 35 soil samples for full priority pollutant analysis, as designated by USEPA. Subsurface soil samples were collected at depths ranging from 10 to 26 feet. Sample locations are shown in Figure Q-2. Analytical data for the soil samples are shown in Table Q-4, which consists of five pages. As can be seen in the table, a wide variety of organic compounds were detected at high concentrations in these samples. The sample analysis consisted of testing for 112 organic compounds, and 63 compounds were confirmed to be present in the subsurface samples.

Specifically, the data showed that thirty-four organic compounds were found at concentrations of 10 ppm or greater. Of these 34 compounds, 20 compounds were detected at concentrations 100 ppm or greater. And of these 20 compounds, 7 compounds were detected at concentrations of 1000 ppm or greater. Compounds detected at concentrations of 1000 ppm or greater include 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, bis(2-ethylhexyl) phthalate, toluene, o-xylene, and PCB-1260. In addition, 2,3,7,8-TCDD was detected in two samples (B48 and B88). Compounds detected in samples taken from Site Q include many of the same compounds as detected in samples taken from Site R, the Sauget Toxic Dump site. Contamination was detected

TABLE Q-4: IDENTIFIED ORGANIC COMPOUNDS IN
SUBSURFACE SOIL SAMPLES FROM SITE 8
SAMPLES COLLECTED JULY 13, THROUGH JULY 20, 1983
BY ECOLOGY AND ENVIRONMENT, INC.)

PARAMETERS	81A (10.0-11.5)	81B (17.5-19.0)	82A (13.5-15.5)	82B (17.5-19.0)	83A (10.0-12.0)	83B (13.5-15.5)	84A (10.0-12.0)	84B (13.5-15.5)
	BORING/SAMPLE NUMBER DEPTH (in feet)							
2,3,7,8-TCDD								3.3
2,4,6-trichlorophenol	2,500	170,000	22,000	320	1,400	1,500		94,000
2-chlorophenol	24,000	63,000	800		1,500	LT	17,000	140,000
2,4-dichlorophenol	66,000	3,100,000	31,000	1700	760	4,500		370,000
2,4-dimethylphenol			500					7,000
4,6-dinitro-2-methylphenol								
pentachlorophenol		86,000	5,400	LT		11,000		100,000
phenol	24,000	55,000	65,000	4,400	3,200	100,000	90,000	98,000
2-methylphenol-4-methylphenol			LT		540	LT		330,000
2,4,5-trichlorophenol				LT				
acenaphthene			1,200	2,800				
1,2,4-trichlorobenzene				400			LT	100,000
1,2-dichlorobenzene	LT		LT			LT		23,000
1,4-dichlorobenzene			1,000	720	LT	760	LT	66,000
fluoranthene				1,200				LT
isophorone								
naphthalene			11,000	8,300				LT
nitrobenzene		6,000	400					56,000
N-nitrosodiphenylamine								
bis(2-ethylhexyl)phthalate				LT				62,000
butyl benzyl phthalate								
di-n-butyl phthalate	LT							LT
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene								
benzo(k)fluoranthene								
chrysene				400				
anthracene								
benzo(ghi)perylene								
fluorene			600	3,000				LT
phenanthrene			1,000	2,700				LT
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)pyrene								
pyrene			LT	LT				LT
aniline								
4-chloroaniline			LT					
dibenzofuran			1,000	3,000				
2-methylnaphthalene			2,000	2,300				
3-nitroaniline			4,400					
benzene								
Chlorobenzene							10,000	40,000
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene								
methylene chloride			7.6	3.7	LM	8.8		
tetrachloroethene								
toluene								
trichloroethene								
acetone			900			977		LM
2-butanone								
4-methyl-2-pentanone						LT		
styrene								
O-xylene				2.8				3,100
PCB-1242								
PCB1254								
PCB-1248	1,000							
PCB-1260			403.2		69.6			
PCB-1016			2,120.6					
Total PCB							60,000	1,300,000

NOTE: All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = not detected.

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E000522

TABLE 3-4 (Continued)

PARAMETERS	B9A 15.0-17.0	B9B 17.0-19.0	B10A 17.0-19.0	B10B 19.0-21.0	B11A 17.0-19.0	B11B 19.0-21.0	B12A 17.0-19.0	B12B 19.0-21.0
				BORING/SAMPLE NUMBER DEPTH (in feet)				
2,3,7,8-TCDD			P		P	P		
2,4,6-trichlorophenol	LT	600	40,300	640			4,400	9,400
2-chlorophenol	640	1,100	1,700	LT			1,200	520
2,4-dichlorophenol	7,400	9,800	170,000	9.60	3,200	20,300	8,800	4,200
2,4-dimethylphenol		LT						
4,6-dinitro-2-methylphenol								
pentachlorophenol		4,800		2,200			24,300	920
phenol	7,500	14,300	32,300	11,300	6,200	37,300	11,300	1,500
2-methylphenol-								
4-methylphenol	1,400	2,300	2,700				1,300	720
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene			11,000					
1,2-dichlorobenzene			11,000		LT			900
1,4-dichlorobenzene		LT	27,000		LT			1,300
fluoranthene								
isophorone					17,000	LT		720
naphthalene			6,500		72,000	39,000	LT	640
nitrobenzene								
N-nitrosodiphenylamine						LT	LT	
bis(2-ethylhexyl)phthalate	640				52,000	36,000	640	
butyl benzyl phthalate					LT			
di-n-butyl phthalate		1,500	LT		23,000	LT		
di-n-octyl phthalate								
diethyl phthalate	LT	840						
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene								1,000
benzo(k)fluoranthene								1,300
chrysene					6,400			
anthracene								
benzo(ghi)perylene								
fluorene								
phenanthrene					5,200			
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)pyrene								
pyrene					5,600			
aniline								
4-chloroaniline								LT
dibenzofuran								
2-methylnaphthalene					10,000			
3-nitroaniline								
benzene			LM					
chlorobenzene			5,200		LM			
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene			6,300		220,000			
methylene chloride	3.3	300	8,700	LT				
tetrachloroethene								
toluene			130,000		1,300,000	100,000		LM
trichloroethene					42,000			
acetone	290	14,000		4,400				
2-butanone								
4-methyl-2-pentanone							LT	
styrene								
o-xylene			38,000		650,000	70,000		LM
PCB-1242	400		NA					
PCB-1254			NA					
PCB-1248			NA		30,000	70,000		
PCB-1260	1,300	1,300	NA	120	45,000	601,000	7,000	5,300
PCB-1016								

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

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E000523

TABLE Q-4 (Continued)

PARAMETERS	B17B 24.0-26.0	B18A 22.3-24.0	B18B 24.3-26.0	Blank 1	Blank 2	Spike @ 3 ppb	Spike @ 3 ppb
	BORING/SAMPLE NUMBER Depth in feet						
2,3,7,8-TCDD						3.37	3.94
2,4,6-trichlorophenol							
2-chlorophenol							
2,4-dichlorophenol	3,800						
2,4-dimethylphenol							
4,6-dinitro-2-methylphenol							
pentachlorophenol							
phenol							
2-methylphenol							
4-methylphenol							
2,4,5-trichlorophenol							
acenaphthene							
1,2,4-trichlorobenzene							
1,2-dichlorobenzene							
1,4-dichlorobenzene	550		LT				
fluoranthene					1,200		
isophorone							
napthalene							
nitorbenzene							
N-nitrosodiphenylamine							
bis(2-ethylhexyl)phthalate	560	910	1,400	LT			
butyl benzyl phthalate							
di-n-butyl phthalate			LT				
di-n-octyl phthalate		LT					
diethyl phthalate							
benzo(a)anthracene		520			400		
benzo(a)pyrene					LT		
benzo(b)flu		LT			LT		
benzo(k)fluoranthene		LT			LT		
chrysene		640			540		
anthracene							
benzo(ghi)perylene							
fluorene							
phenanthrene					720		
dibenzo(a,h)anthracene							
indeno(1,2,3-cd)pyrene							
pyrene		LT			600		
aniline	31,000	1,700					
4-chloroaniline		900					
dibenzofuran							
2-methylnapthalene							
3-nitroaniline							
benzene							
Chlorobenzene	4.1						
1,2-dichloroethane							
1,1-dichloroethane							
1,1,2,2-tetrachloroethane							
1,2-trans-dichloroethene							
ethylbenzene	7.7						
methylene chloride	6.1	19.0	47.0	LM	6.9		
tetrachloroethene							
toluene							
trichloroethene							
acetone	2,000		200				
2-butanone							
4-methyl-2-pentanone							
styrene							
o-xylene	23.0						
PCB-1242							
PCB1254							
PCB-1248							
PCB-1260	140		2,400		200		
PCB-1016							
Total PCB		670					

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample, could not be cleaned up sufficiently.
Blank = Not detected.

CER 051566

E000524

cover material, and to provide an estimate of leachate production. The ground and surface hydrology should be assessed over a period of time sufficient to address seasonal fluctuations. This assessment would provide data to determine ground water discharge and recharge in relation to the river. Additional investigation, if necessary, would be proposed following the completion of these activities.

SITE R - SAUGET TOXIC DUMP

Site Description

Site R is the Sauget Toxic Dump, an inactive industrial waste landfill used by the Monsanto Chemical Company between the years 1957 and 1977. Site R occupies approximately 36 acres adjacent to the Mississippi River in Sauget, Illinois. The site is located immediately west of Site Q, commonly known as the Sauget Landfill. Site R is presently covered with a clay cap and vegetated, and drainage is directed to ditches around the perimeter of the site. A Monsanto feedstock tank farm is located adjacent to the site on the northwest side.

Site History and Previous Investigation

Site R, also known as the Krummrich Landfill, was operated by Sauget and Company under contract with Monsanto. According to an Eckhardt Report summary sheet submitted in 1979 by Monsanto, approximately 262,500 tons of liquid and solid industrial wastes were disposed of at Site R from Monsanto plants in Sauget and St. Louis. In 1981, Monsanto submitted two Notification of Hazardous Waste Site Forms for Site R to the USEPA. The Monsanto W.G. Krummrich Plant (Sauget) listed 290,000 cubic yards (c.y.) of organics, inorganics, solvents, pesticides, and heavy metals as having been disposed at Site R. The Monsanto J. F. Queeny Plant (St. Louis) listed 6600 c.y. of the same waste types as above. Both notifications also indicated below-ground disposal of drums.

Monsanto has also submitted two reports to IEPA outling waste types and volumes disposed of at Site R for the years 1968 and 1972. Data compiled from these reports are summarized in Table R-1. This tabulation shows that the volume of wastes landfilled in 1972 was significantly lower than that in 1968 This reduction reflects the elimination of several major production operations at Monsanto's Krummrich Plant. By 1975, the majority of chemical waste disposal at

CER 051568

E000526

Site R had been terminated, as wastes were either hauled to other disposal facilities or incinerated on the plant site.

Very little information is available concerning disposal activities at Site R prior to 1967. In March, 1967, Sauget and Company filed an application for registration to operate a refuse disposal facility to the Illinois Department of Public Health. Health Department inspection reports from 1967 indicate disposal of liquid chemical wastes and metal containers from Monsanto. Liquids were pumped from tank trucks and drums into several pits around the site. Cinders were used as intermediate cover material.

In August, 1968, the Illinois Department of Public Health collected five ground water samples from on-site monitoring wells. The locations of these wells are shown in Figure R-1, and analytical results are presented in Table R-2. Phenols were detected in all wells at concentrations ranging from 15 to 1220 ppb. Alkalinity and total solids were also analyzed for, but no significant conclusions can be made from the data for these parameters.

IEPA began making routine inspections at Site R in 1971. Photographs of the site at this time suggest that wastes were disposed of in direct contact with the ground water. No segregation of liquid wastes was apparent in these photographs. IEPA collected another set of samples from the monitoring wells in December, 1972. Analytical data for these samples are shown in Table R-3. The results indicate concentrations of iron, zinc, and phenol above the State's water quality standards. Oil was also detected in wells MW-1 and MW-4. Samples were also collected from waste ponds at Site R by IEPA in January, 1973 and analyzed for phenol. Two samples were collected from pits identified as crystallization ponds, and one sample was taken from a spent caustic pond. Results for the waste pond samples are shown in Table R-4. High concentrations of phenols were detected in all samples.

In 1973, IEPA sent notices to Sauget and Company and Monsanto

CER 051569

E000527

TABLE R-2: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED AUGUST 22, 1968 BY THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH)

PARAMETERS	SAMPLE LOCATIONS				
	MW-1	MW-3	MW-4	MW-5	MW-6
Total Solids (conductivity mmhos)	320	300	280	250	500
Alkalinity (ppm)	172	148	156	124	248
Phenol (ppb)	1220	25	20	15	1200

CER 051570

E000528

TABLE R-4: ANALYSIS OF SURFACE WATER SAMPLES FROM WASTE PONDS AT SITE R (COLLECTED JANUARY 18, 1973 BY IEPA)

	SAMPLE LOCATIONS		
PARAMETER	CRYSTALLIZATION POND 221	CRYSTALLIZATION POND 270	SPENT CAUSTIC POND
Phenol	2800	50,000	2,000

NOTE: Results in mg/l (ppm).

CER 051571

TABLE R-5: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 22, 1973 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS MW-1	MW-2	MW-4	MW-5	RANNEY WELL
Iron	6.8	11	0.8	6.6	1.9
Manganese	0.35	0.55	0.05	1.05	0.92
Mercury (ppb)	0.4			0.2	
Zinc	1.9	0.6		1.5	
Ammonia	1.6	2.6	0.7	1.3	0.98
Phenol (ppb)	150	80			7500
BOD	31	48	1	1	85
COD	51	78	16	13	220

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

CER 051572

E000530

TABLE R-7: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED OCTOBER 28, 1975 BY IEPA).

	SAMPLE LOCATIONS			
PARAMETERS	RANNEY WELL	MW-2	MW-4	MW-5
Ammonia				
Arsenic	0.002		0.002	
Barium	0.1	0.1	0.1	0.2
Boron	0.7	0.9	0.5	0.2
Cadmium				
COD	345	210	12	16
Chloride	110	200	23	20
Cyanide		0.02	0.01	
Iron	4.5	13.4	1.45	11
Lead	0.02		0.01	0.04
Manganese	1.3	0.2	0.1	0.7
Nitrate		0.3	0.2	0.1
Oil	3	6	2	3
Phenol	19	1.1	0.025	0.013
R.O.E.	300	920	230	200
Selenium	0.02			
Sulfate	95	6	22	15

NOTE: All results in mg/l, (ppm).
Blanks indicate not detected.

CER 051573

wells were installed. The D'Appolonia study concluded that the landfill area consisted of 5 to 20 feet of flyash, cinders, silty clay, and unidentified waste. The landfill is underlain by alluvium, consisting of fine sands, silt, and clay ranging in thickness from 5 to 50 feet. Field permeability tests showed that alluvium is fairly permeable (1×10^{-3} cm/sec) suggesting that silty sand is the major component of the alluvium. This finding is supported by the evidence of vertical migration of contaminants to a depth of 65 feet, as suggested in the boring logs. Water levels were generally 25 to 30 feet below ground surface.

In May, 1978, Monsanto filed closure documents to IEPA detailing a closure plan for the site. In general, the plan consisted of specifications for the installation of a drainage system and clay cap, along with details for grading, seeding, and access restriction. The Helmkamp Construction Company was retained to implement the closure plan. An IEPA inspection report from October, 1979 indicated that closure operations at Site R were complete, including installation of a clay cap 3 to 6 feet in thickness. In February, 1980, Richard Sinise, an Environmental Control Engineer for Monsanto, filed an Affidavit of Closure for Site R.

IEPA personnel collected ground water samples from monitoring wells installed by D'Applonia in October, 1979 (Figure R-1). The samples were analyzed for inorganics and organic parameters reported by Monsanto to have been disposed of at the site. Analytical results for these samples are shown in Table R-9. Analysis showed the presence of several organic contaminants in the wells. Both shallow (25 to 35 feet) and deep (60 to 70 feet) wells were sampled, and chlorotoluene and phenol were found in all wells sampled. Well B-19S, located in the southeast portion of the site, also showed chlorophenol, dichlorobenzene, and diphenyl ether at concentrations ranging from 0.81 to 2.1 ppm. Iron, copper, and zinc exceeded water quality standards in several wells. Another set of samples was

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collected by the IEPA from the D'Appolonia monitoring wells in March, 1981. These samples were analyzed specifically for organic compounds. Analytical data for these samples are shown in Table R-10. Concentrations of organic contaminants were detected in all wells sampled. Chlorobenzene (130 to 3000 ppb) was detected in all wells, while biphenylamine, chlorophenol, dichlorobenzene, and dichlorophenol were seen in five or more wells.

In October, 1981, IEPA collected leachate and sediment samples at Site R from an area adjacent to the Mississippi River. Leachate and sediment samples were collected from three locations where leachate seeps were observed flowing from the landfill into the river. Analytical results for these samples are presented in Table R-11, and locations of the samples are shown in Figure R-1. The three water samples showed contamination with a wide variety of organic compounds. PCBs and chloroaniline were detected in all sediment samples. Other compounds detected in sediment samples included 2,4-dichlorophenoxy-acetic acid (2,4-D), chloronitrobenzene, dichloroaniline, chlorophenol, biphenyl-2-ol, and dichlorophenol. The presence of 2,4-D and chlorinated phenols in these samples suggested that dioxin was also a potential contaminant at the site. The IEPA subsequently requested assistance from USEPA in securing a laboratory to perform dioxin analysis on leachate samples from Site R. In November, 1981 a USEPA contractor (Ecology and Environment, Inc.) collected leachate and sediment samples at three locations adjacent to the river (Figure R-1). A total of eight samples plus three blanks were collected. Dioxin analysis was performed by the Brehm Laboratory at Wright State University. Monsanto obtained split samples and analyzed for chlorinated dibenzo-p-dioxins (CDDs), select organics, and metals. The USEPA samples were analyzed for tetra through octa CDDs and dibenzofurans (CDFs), select organics, and metals. Table R-12 provides an explanation and cross-reference for samples collected by USEPA and Monsanto.

Analytical results for CDDs and CDFs in the USEPA leachate samples

TABLE: R-11: ANALYSIS OF LEACHATE AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED OCTOBER 2, 1981 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS: SAMPLE A (WATER) 0022687	SAMPLE B (WATER) 0022688	SAMPLE C (WATER) 0022689	SOIL SAMPLE A 0022690	SOIL SAMPLE B 0022692	SOIL SAMPLE C 0022692
PCB			2.6	40	150	230
Toluene	11	40	150			
Chlorobenzene	160	390	1,600			
Chloroaniline	24,000	22,000	30,000	1,700	190	6,900
Chloronitrobenzene	21,000	9,600	820		130	
2,4-D	16,000	17,000	7,000	53	(<5)	(<5)
2,4,5-T				(<6)	(<5)	(<5)
Dichloronitrobenzene	740	590	790			
Dichloroaniline	870	820	2,000			190
Chloronitroaniline	84	33				
Nitroaniline	100	23				
Chlorophenol	15,000	30,000	27,000			290
Phenol	22,000	17,000	12,000			
Methylphenol	570	220	110			
Dichlorophenol	32,000	7,200	2,100	40		
Nitrophenol	600					
Biphenyldiol	1,700					
Aniline	550	120	35			
Methylbenzene	100	2,000	140			
Sucpenamide						
4-methyl-2-pentanol	26					
2-methyl cyclopentanol	93					
Biphenyl 2-01	300	300	200			310
Benzenesulfonamide	76	630				
Dichlorobenzene		110	250			
Benzoic Acid/Derivatives	12,000	6,600	2,000			
Hydroxybenzoic Acid/ Derivatives	12,000					
2,4-D Isomer	30,000	40,000	29,000			
2,4,5-T Isomer	10,000	12,000	6,500			

NOTE: All results in ppb.
Blanks indicate below detection limits.
( ) indicates values are unconfirmed.

CER 051576

E000534

are shown in Table R-13. Tetra- and penta-CDDs and CDFS were not detected in any of the samples. However, higher chlorinated dioxins and furans (hexa through octa isomers) were detected in three of the five samples submitted for analysis. Concentrations of these compounds ranged from 4.5 to 2693 parts per trillion (ppt). The two remaining samples, S07 and R01, were water blanks, and showed no detectable CDDs or CDFs. Monsanto also analyzed samples M01 through M05 for CDDs, and results showed no detectable concentrations of these compounds.

Inorganic data for the leachate and sediment samples from Site R are shown in Tables R-14 and R-15. In general, the leachate samples did not show significant inorganic contamination, although concentrations of chromium, copper, boron and iron exceeded water quality standards in two or more samples. Cyanide was detected in several samples, but was also found in the blank. Therefore, the results for cyanide should be considered unreliable. Data for the sediment samples show more substantial evidence of contamination. Elevated levels of arsenic, chromium, copper, lead, and barium were found in several samples. Identified organic compounds in leachate and sediment samples are listed in Table R-16. Phenol and chlorinated phenols were found in all but one sediment sample (M02) at concentrations ranging from 0.2 to 300 ppb. Leachate samples showed elevated levels of several organic parameters, including chlorinated phenols, chlorinated benzenes, chloroanilines, and 2,4-D. As shown in Table R-16, there is a significant discrepancy in the Monsanto and USEPA data for the sediment samples. The values listed by Monsanto were consistently and substantially higher than USEPA values. This may be explained by the fact that USEPA's samples were initially analyzed as medium hazard samples. Because of the higher detection limits associated with this analysis, no contaminants were initially found. USEPA subsequently decided to rerun the samples at lower detection limits. It is possible that the increased holding time and handling of these samples were instrumental in the reduction of concentrations of contaminants found.

CER 051577

Site R was assessed using USEPAs Hazard Ranking System (HRS) model in

TABLE R-14: INORGANIC ANALYSIS OF LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS							
PARAMETERS	S01	M01	001	S03	M03	S05	M05	R01
Arsenic	0.034	0.02	0.031	0.016	0.025	0.029	0.065	
Mercury	0.0002		0.0002	0.0002	0.0014	0.0008	0.001	
Selenium	0.038		0.032	0.026		0.031		
Thallium								
Antimony								
Beryllium		0.008			0.005		0.008	
Cadmium		0.006			0.007		0.008	
Chromium	0.04	0.086	0.02	0.015	0.075	0.02	0.07	0.01
Copper		0.073			0.092		0.08	
Lead	0.005		0.008					
Nickel	0.04	0.155			0.124		0.144	
Silver						0.01		
Zinc	0.048	0.216	0.024	0.01	0.216	0.049	0.062	0.31
Aluminum		26.8			30.5		3.22	
Barium		0.5			0.5		0.36	
Boron	19.7	18	17.1	15.35	13.6	21.6	19.1	
Calcium	N/A	368	N/A	N/A	257	N/A	257	N/A
Cobalt		0.03			0.019		0.031	
Iron	0.06	25.5	0.06		30.8	0.63	27.4	
Magnesium	N/A	43.2	N/A	N/A	48.2	N/A	39.8	N/A
Manganese	0.02	6.27	0.32	1.99	2.1	5.4	3.82	0.03
Molybdenum	N/A	0.53	N/A	N/A	0.403	N/A	0.439	N/A
Phosphorus	N/A	0.9	N/A	N/A	0.907	N/A	2.06	N/A
Sodium	N/A	40.4	N/A	N/A	41.8	N/A	44.2	N/A
Tin						0.02	1.4	
Vanadium		0.18			0.138		0.17	
Cyanide	0.071	N/A	0.057	N/A	N/A	N/A	N/A	0.13

NOTE: All Results in ppm.
Blanks indicate below detection limits.
N/A - Parameter not analyzed.
R01 is a water blank.

CER 051578

TABLE R-16: IDENTIFIED ORGANIC COMPOUNDS IN LEACHATE
AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS								
	LEACHATE			SEDIMENT					
PARAMETERS	MO1	MO3	MO5	S02	MO2	S04	MO4	S06	MO6
2-Chlorophenol	300	100		0.26		0.2	200	0.4	
2,4-Dichlorophenol	100					0.42		0.56	
Phenol	130					0.5	300	0.42	300
2,4,6-Trichlorophenol								0.32	
1,4-Dichlorobenzene	30				200		400		600
1,2-Dichlorobenzene	20								
Bis(2 ethylhexyl) Phthalate					400		300		400
Chlorobenzene	160	30							
Aniline	60	40	25						
Chloroanilines	8000	4000	600						
Dichloroanilines	100	40							200
Chloronitrobenzenes	3000	80							
2,4-D	332	100							
PCBs			0.008		0.014		0.034		0.192

NOTE: All results in parts per billion (ppb).
Blanks indicate below detection limit.

CER 051579

E000537

detected in monitoring wells and leachate samples from Site R as they relate to wastes reported by Monsanto to have been disposed of at the site. Also included in the analysis were chemicals reported as being manufactured at Monsanto's Krummrich Plant, as documented in the 1977 chemical inventory developed as a result of the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The analysis revealed a high degree of association or correlation between chemicals detected in the sample, and those reported to have been disposed of or manufactured by Monsanto. A summary of data from this USEPA analysis report is presented in Table R-17.

In 1984, Monsanto contracted Geraghty and Miller, Inc. to perform a detailed hydrogeologic investigation in the Sauget area. Data from this study, which included the installation of approximately 60 monitoring wells, have not been made available.

Data Assessment and Recommendations

A great deal of data has been developed to date for Site R. Organic contaminants have been detected in both shallow and deep monitoring wells on site, as well as in leachate seeps leaving the site. Evidence of contamination has been observed to a depth of approximately 60 feet in soil borings. A substantial listing of the types and quantities of chemical wastes disposed of at the site was submitted to IEPA by Monsanto. In view of this information the only significant data gaps are: (1) specific delineation of contaminant boundaries, and (2) determination of the presence or absence of air emissions from the site. Because of the permeable nature of the subsurface soils and the characteristics of the wastes present at the site, it is likely that extensive migration of contaminants has occurred.

The present scope of work for the Dead Creek Project includes installation and sampling of monitoring wells at Site R. Ambient air monitoring will also be conducted to determine to what extent, if any, off-gassing of organic contaminants is occurring. Every effort should be made by th IEPA to obtain data on, and gain access to, the Monsanto wells installed by Geraghty and Miller. Access to these wells would likely eliminate the need for, or at least affect the location of, the monitoring wells to be installed during the field investigation of Site R. Pending the results of ground water sampling, a more specific approach to delineating the extent of contamination could be proposed. Samples should initially be collected from a minimum of 8 wells on Site R, and hydraulic conductivity tests should be run on a minimum of 2 deep and 2 shallow wells. Possibilities for identifying plume characteristics include conducting electromagenetic surveys (including off site areas), and soil gas monitoring. In any event, the lateral and vertical extent of contaminantion must be addressed prior to design of remedial options.

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CREEK SECTOR 8 - DEAD CREEK

Site Description

Creek Sector 8 (CS-8) includes the portion of Dead Creek lying between Queeny Avenue and Judith Lane in Sauget, Illinois. Three other sites in the Dead Creek Project are located adjacent to CS-8. These include Site G to the northwest, Site L to the northeast, and Site M to the southeast. All of these sites have been identified at one time or another as possible sources of pollution in CS-8. Presently, CS-8 and Site M are enclosed by a chain link fence which was installed by the USEPA in 1982. The banks of the creek are heavily vegetated, and debris is scattered throughout the northern one-half of CS-8. Culverts at Queeny Avenue and Judith Lane have been blocked in order to prevent any release of contaminants to the remainder of the creek, although the adequacy of these blocks has been questioned several times. Water levels in the creek vary substantially depending on rainfall, and during extended periods of no precipitation, the creek becomes a dry ditch.

Site History and Previous Investigations

The IEPA initially became aware of environmental problems at CS-8 in May, 1980 when several complaints were received concerning smouldering and fires observed the creek bed. In August, 1980, a local resident's dog died, apparently of chemical burns resulting from contact with materials in the ditch. Following this incident, the IEPA conducted preliminary sampling to determine the cause of these problems in CS-8. Chemical analysis of these samples indicated high levels of PCBs, phosphorus, and heavy metals, and the IEPA subsequently authorized the installation of fencing in order to prevent public access to the creek. In September 1980, the Illinois Department of Transportation (IDOT) completed installation of 7000 feet of snow fence with warning signs around CS-8 and Site M. The IEPA subsequently performed a preliminary hydrogeological investigation in the area in an attempt to identify the sources of pollution

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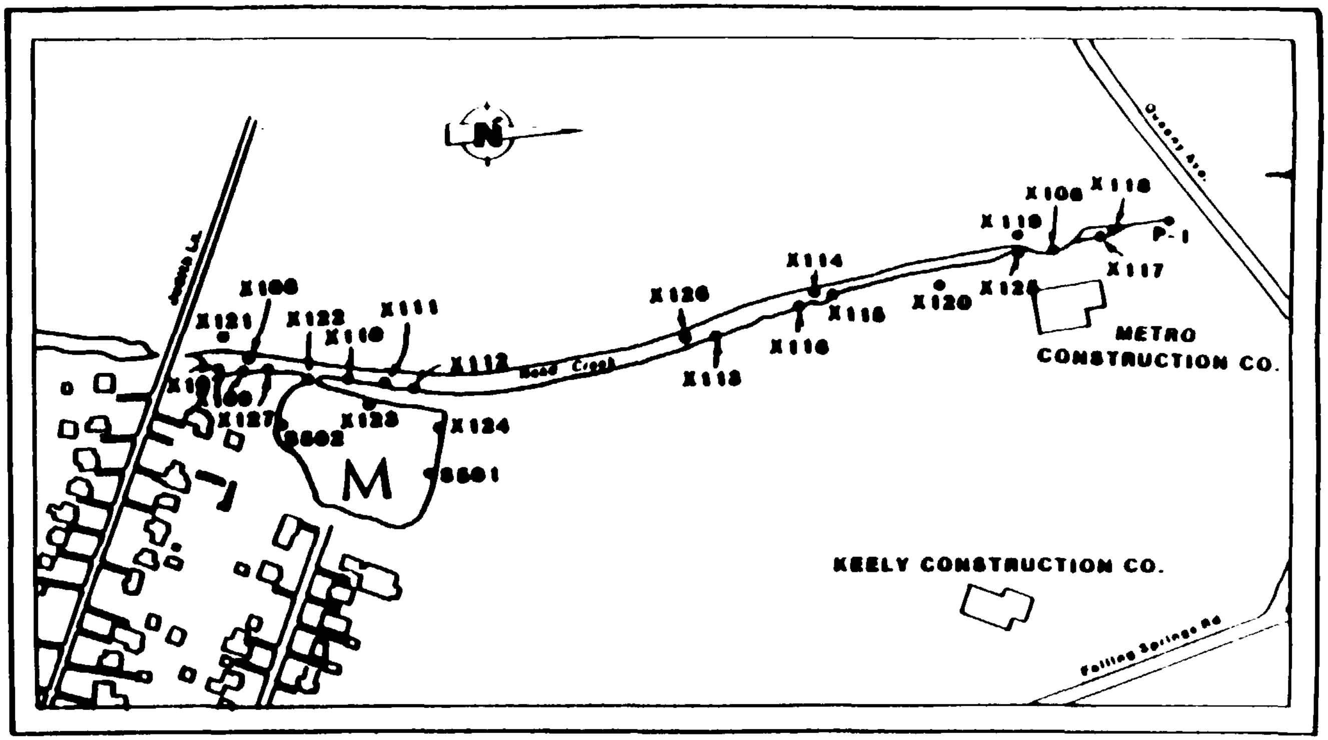

LEGEND
X106 SEDIMENT SAMPLING LOCATION
SS02 SURFACE WATER SAMPLING LOCATION
P-1 SUBSURFACE SOIL SAMPLING LOCATION

SCALE
0 100 200 300 FEET

FIGURE B-1
IEPA SAMPLING LOCATIONS AT CREEK SECTOR B AND SITE M

investigation. In general, inorganic analysis of these samples indicated high levels of several metals in comparison with background conditions (Table 8-3, sample x121).

Subsurface soil samples were also collected by IEPA from one location in the northern portion of CS-8 during the 1980 investigation. Analyses of samples from boring P-1 are included in Table 8-2. Results indicated the presence of PCBs to a depth of seven feet, and other organic contaminants to a depth of three feet. PCB concentrations ranged from 9,200 ppm near the surface to 53 ppm at depths greater than 4 feet and up to 7 feet. Other organic contaminants were detected at concentrations ranging from 12,000 ppm near the surface to 240 ppm at 2.5 feet. These results indicate non-uniform contaminant deposition in the northern portion of CS-8, which is common in riverine systems. The above data indicate that historical release(s) of contaminants to the northern portion of CS-8 did occur. However, the horizontal and vertical extent of the resulting contamination has not been fully defined.

Analyses of sediment samples from the southern portion of CS-8 are summarized in Table 8-3. Sample x121 was taken from soil outside the creek bed to establish background conditions. Samples x107, x122, and x127 contained PCBs at concentrations ranging from 73 to 540 ppm. Sample x122 also showed diclorobenzene (0.35 ppm). This was the only organic contaminant other than PCBs detected in samples from the southern portion of CS-8. Several metals, including arsenic, cadmium, chromium, copper, lead, and zinc, were detected at levels significantly above background concentrations in all samples. However, the metal concentrations were comparable to concentrations detected in samples of sediment taken in the northern portion of CS-8. All of the samples were collected from the creek bed adjacent to, or downstream from Site M, which is an old sand pit excavated by the H.H. Hall Construction Company in approximately 1950. Hazardous materials were not reported to have been disposed of at Site M.

In October, 1980 IEPA and Monsanto Chemical Company cooperatively

TABLE B-3: ANALYSIS OF SOIL SAMPLES IN THE SOUTHERN PORTION OF CREEK SECTOR B (COLLECTED BY IEPA 9-8-80 THROUGH 10-25-80)

PARAMETERS	SAMPLE LOCATIONS x107	x108	x109	x110	x111	x112	x121	x122	x127
Aluminum		8,000	9,100	7,000	8,000	6,600			
Arsenic	6,000	44	25	67	80	50			
Barium	4,800	3,800	1,600	4,300	1,800	8,000	230	5,500	2,50
Beryllium	-	-	-	-	-	-	-	2	2
Boron	-	-	-	-	-	-	-	-	-
Cadmium	70	-	200	40	100	100	1	35	50
Calcium	11,000	10,000	24,000	16,000	13,000	30,000	11,000	15,000	8,000
Chromium	360	300	-	140	50	50	-	50	340
Cobalt	30	30	20	-	-	30	9	15	30
Copper	32,000	31,000	7,700	22,000	15,000	41,000	100	21,900	28,000
Iron	70,000	58,000	75,000	67,000	68,000	52,000	16,500	50,000	63,000
Lead	24,000	2,000	1,700	2,000	2,000	5,100	-	1,700	1,700
Magnesium	2,900	3,900	3,600	4,100	4,000	4,000	5,900	3,800	2,700
Manganese	150	150	300	200	160	300	370	190	150
Mercury	-	1.7	3	3.3	3.2	6	-	-	-
Nickel	3,500	3,000	900	1,900	2,000	2,700	120	1,700	
Phosphorus	7,040	-	-	-	-	-	-	-	4,700
Potassium	1,200	1,500	1,700	1,300	1,600	1,200	1,500	960	1,000
Silver	40	-	-	-	-	-	-	30	40
Sodium	1,700	900	900	700	1,000	1,600	80	630	700
Strontium	180	200	130	160	160	430	32	190	130
Vanadium	60	-	-	70	100	-	25	45	45
Zinc	25,000	22,000	27,000	25,000	47,000	52,000	230	19,900	28,000
PCBs	120	-	-	-	-	-	-	540	73
Dichlorobenzene	-	-	-	-	-	-	-	0.35	-

NOTE: All results in ppm
Blanks indicate that parameter not analyzed
- Indicates parameter is below detector limit

TABLE 8-4: ORGANIC ANALYSIS OF SEDIMENT SAMPLES FROM DEAD CREEK, SECTOR B (SPLIT SAMPLES-IEPA AND MONSANTO COLLECTED 10-2-80)

PARAMETERS	SAMPLE LOCATIONS SD-1	SD-2	SD-3	Blank*
CHLOROBENZENES:				
Monochlorobenzene	(0.9)		(0.3)	
p-Dichlorobenzene	370	(0.3)	(0.4)	
o-Dichlorobenzene	80	(0.6)	1	
Trichlorobenzenes	85	1.6	(0.7)	
Tetrachlorobenzenes	6.1	2.4	(0.4)	
Pentacesorobenzene				
Hexachlorobenzene		1.2		
Nitrochlorobenzenes	120			
CHLOROPHENOLS:				
o-Chlorophenol	3.7			
p-Chlorophenol	6.6		(0.9)	
2,4-Dichlorophenol	1.2			
Pentachlorophenol	130		1.8	
PHOSPHATE ESTERS:				
Dibutylphenyl Phosphate	330		(0.8)	
Butyldiphenyl Phosphate			(0.8)	
Triphenyl Phosphate	2600			
2-Ethylhexyldiphenyl Phosphate			2.2	
Isodecyldiphenyl Phosphate				
T-Butylphenyldiphenyl Phosphate	28			
Di-t-butylphenyldiphenyl Phosphate				
Nonylphenyl Diphenyl Phosphate				
Cumylphenyldiphenl Phosphate	3.7			
PCBs (Cl_2 to Cl_6 Homologs)	13,000	240	45	

NOTE: All values in ppm
*Soil blank collected from Missouri Bottoms, St. Charles, Mo.
Blanks indicate below detection limits
( ) Semi-quantitative values

sampling of 12 monitoring wells in addition to the 1980 soil/sediment sampling described above. Residential wells were also sampled to determine ground water quality in the area. Locations of IEPA monitoring wells and residential well samples are shown in Figure 8-2. All IEPA wells were screened in the Henry Formation sands, with screened interval elevations ranging between 366 and 402 feet Mean Sea Level. The hydraulic gradient in the vicinity of CS-8 is very flat, with ground water flow generally to the west toward the Mississippi River.

Analytical data for three sets of samples from the IEPA monitoring wells, corresponding to three sampling events in 1980 and 1981, are presented in Tables 8-6, 8-7, and 8-8. Well G108 can be considered a background well due to its location upgradient from the known disposal areas around CS-8. Organic contaminants were consistently found in Wells G107 and G112. These wells are in downgradient monitoring positions for sites G and I respectively. Certain organic contaminants were detected in Wells G102, G109 and G110 during the initial sample event, but these wells did not show any of the organics in subsequent samples. Well G102 is located immediately west of the northern portion of CS-8, and near the southeast corner of Site G. Well G109 is located approximately 150 feet west of the former Waggoner surface impoundment (Site L). Well G110 is located downgradient of Site H. PCBs were detected at one time or another in Wells G101, G102, G104, G106, G107, G110, and G112. Of these, only G101 and G102 showed PCBs in all three sets of samples.

Inorganic analyses of samples from the IEPA monitoring wells indicate several parameters at concentrations above background (G108) and water quality standards. Standards for iron, manganese, and phosphorus were exceeded in samples from the background well. Barium, cadmium and lead were detected at concentrations exceeding standards in one or more well(s). In general, wells G109, G110, and G112 showed the most significant inorganic contamination. When compared with data for other wells, G109 contained very high concentrations of arsenic, copper, nickel, and zinc. The pH for G109

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TABLE 8-6: ANALYSIS OF GROUNDWATER SAMPLES FROM THE IEPA MONITORING WELLS
(COLLECTED 10-23-80)

	SAMPLE LOCATIONS											
PARAMETERS	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	382	418	336	406	271	387	552	375	287	210	302	699
Ammonia	0.3	1.0	1.7	0.4	0.9	2.9	0.5	0.3	4.5	1.2	0.1	1.5
Arsenic	0.023	0.023	0.043	0.049	0.067	0.16	0.043	0.008	0.055	0.053	0.008	0.019
Barium	1.3	0.8	2.9	2.2	2.0	0.6	2.1	0.3	0.2	0.5	0.2	0.5
Boron	0.5	0.4	0.5	0.6	0.4	0.5	0.5	0.4	0.4	0.5	0.5	5.6
Cadmium	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.06
Calcium	180	210	210	210	340	185	580	140	380	500	110	242
BOD	237	160	244	206	473	115	1070	298	275	780	79	162
Chloride	40	103	58	52	65	100	132	79	69	61	32	363
Chromium (Total)	0.04	0.02	0.09	0.04	0.12	0.01	0.07	0.0	0.0	0.38	0.0	0.01
Chromium (+6)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Copper	0.46	0.13	1.1	0.31	0.73	0.44	0.68	0.04	0.13	2.3	0.04	1.2
Cyanide												0.0
Fluoride	0.4	0.7	0.7	0.3	1.0	0.7	0.7	0.3	1.2	0.8	0.3	0.5
Hardness	501	804	549	630	528	637	777	496	1664	279	419	1080
Iron	51.0	30.5	86	90	18	62	13	4.1	39.0	340	5	18
Lead	0.10	0.15	0.26	0.2	0.31	0.0	0.27	0.0	0.0	7.3	0.07	0.44
Magnesium	0.00	98	79	72	100	49	205	24	100	209	24	82.5
Manganese	5.1	3.8	4.2	3.4	4.2	1.9	9.8	0.98	4.5	8.0	1.1	3.9
Mercury	0.0	0.0	0.0002	0.0	0.0	0.0	0.0	0.0001	0.0	0.0	0.0	0.0001
Nickel	0.1	0.1	0.9	0.1	0.0	0.1	0.3	0.0	0.5	1.9	0.0	0.1
Nitrate-Nitrite	0.1	0.1	0.1	0.4	0.0	0.1	0.1	1.1	0.0	0.4	0.5	0.0
pH	6.6	6.6	6.5	6.6	6.6	6.5	6.4	6.6	6.3	6.7	7.0	6.4
Phenolics	0.0	.01	0.0	0.006	0.0	0.065	2.5	0.01	0.45	0.015	0.0	0.875
Phosphorus	2.9	1.2	3.3	2.7	6.0	1.8	9.4	.18	.72	16	24	.69
Potassium	10.6	13.1	13.4	12.3	22	7.7	15.2	13.7	14.9	29	4.9	58
R.O.E.	650	1230	765	790	824	1020	1230	704	2460	508	512	2130
Selenium	0.003	0.001	0.004	0.01	0.008	0.001	0.004	0.001	0.001	0.005	0.002	0.001
Silver	0.01	0.0	0.2	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.02	0.11
Sodium	24	60	40	29	57	96		40	40	53	24	260
S.C.	870	1500	1050	1080	1040	1340	1430	960	2470	720	490	--
Sulfate	132	434	230	204	296	201	201	103	1348	93	104	518
Z	0.6	0.4	6.2	0.3	3.7	0.1	0.8	0.0	0.1	8.0	0.0	7.8
PCB (ppb)	1.0	1.2	-	-	-	-	-	-	-	2.7	-	-
Chlorophenol (ppb)	-	1200	-	-	-	-	630	-	19	-		
Chlorobenzene (ppb)	-	-	-	-	-	-	19	-	-	-		100
Dichlorobenzene (ppb)	-	-	-	-	-	-	25	-	-	-	-	65
Dichlorophenol (ppb)	-	-	-	-	-	-	890	-	-			-
Cyclohexanone (ppb)	-	-	-	-	-	-	-	-	120	5.9		
Chloroaniline (ppb)	-	-	-	-	-	-	-	-	-			1500

NOTE: All results in ppm unless otherwise noted.
Blanks indicate parameter not analyzed.
- indicates below detection limits.

TABLE 8-8: ANALYSIS OF GROUNDWATER SAMPLES FROM THE IEPA MONITORING WELLS
(COLLECTED 3-10-81 - 3-11-81)

PARAMETERS	SAMPLE LOCATIONS											
	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	403	404	319	568	393	594	667	464	58	331	387	400
Ammonia	0.2	0.0	1.6	0.0	0.4	3.0	0.2	0.0	15	0.0	0.1	0.7
Arsenic	0.001	0.0	0.003	0.001	0.013	0.006	0.004	0.001	3.9	0.001	0.001	0.00
Barium	0.0	0.7	0.1	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.1	0.0
Boron	0.2	0.4	0.3	0.7	0.3	0.5	0.5	0.2	0.5	0.1	0.4	3.4
Cadmium	0.0	0.01	0.01	0.0	0.0	0.0	0.01	0.0	0.07	1.1	0.0	0.17
Calcium	154	333	161	206	218	175	185	148	431	121	164	207
BOD	10	24	47	9	23	146	47	12	930	10	9	52
Chloride	16	124	46	28	57	150	235	51	24	27	16	133
Chromium (Total)	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0
Copper	0.04	0.06	0.08	0.02	0.02	0.01	0.01	0.03	67	0.02	0.07	0.48
Cyanide	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hardness	542	1062	620	839	796	675	1006	479	1651	424	485	789
Iron	0.3	0.3	1.6	0.0	9.4	4.9	2.4	0.0	1.4	0.0	0.2	0.5
Lead	0.0	0.0	0.0	0.0	0.0	0.06	0.0	0.0	0.0	0.0	0.07	0.0
Magnesium	34.2	77.9	41.9	56.8	47	44.8	44.8	22.3	130	28.7	31.8	72
Manganese	2.8	2.98	3.51	0.61	2.32	1.62	2.12	0.23	6.22	0.14	1.02	2.1
Mercury	-	-	-	-	-	-	0.0002	-	0.0003	-	-	-
Nickel	0.0	0.3	1.1	0.0	0.2	0.0	0.0	0.1	123	1.2	0.0	0.4
Nitrate-Nitrite	0.0	1.1	0.0	2.3	0.0	0.0	0.0	0.3	0.3	15	2.7	0.2
pH	6.9	6.8	6.8	6.9	6.8	6.7	6.7	7.0	4.6	6.6	6.8	6.6
Phenolics	0.0	0.0	0.006	0.0	0.0	0.0	1.7	0.1	1.4	0.0	0.0	0.00
Phosphorus	0.0	0.08	0.03	0.02	0.1	1.5	0.03	0.02	2.2	0.01	0.01	0.03
Potassium	4.0	10.0	10.4	5.9	8.9	5.7	2.0	18.2	6.4	6.3	2.9	40.2
Selenium	0.0	0.0	0.001	0.003	0.0	0.0	0.0	0.001	0.003	0.018	0.001	0.0
Silver	0.01	0.02	0.0	0.0	0.02	0.01	0.01	0.0	0.0	0.01	0.01	0.01
Sodium	11	64	65.6	17.4	51.2	92.6	39.2	25.2	12.1	14.2	15.5	96.6
Sulfate	118	617	471	303	466	146	313	55	2629	61	147	544
Zinc	0.1	0.0	2.8	0.1	0.3	0.1	0.1	0.3	6.3	1.8	0.1	11.8
PCB (ppb)	0.13	0.46	-	0.1	-	2.4	0.37	-	-	0.9	-	2.0

NOTE: All results in ppm unless otherwise noted.
Blanks indicate parameter not analyzed.
- indictes below detection limits.

TABLE 8-9: ANALYSIS OF RESIDENTIAL WELL AND SEEPAGE SAMPLES COLLECTED BY IEPA

PARAMETERS	SAMPLE DATES AND LOCATIONS					
	9/16/80 G501	9/16/80 G502	9/16/80 G503	9/23/80 G504	6/8/83 G505	1/5/83 x301
Arsenic	0.008	0.004	0.001		0.01	[illegible]
Barium	0.2	0.16	0.39	0.05	0.4	[illegible]
Boron	0.28	0.27	0.25	0.58	0.4	0.3
Cadmium						
Chromium						
Copper	0.02			0.06	0.01	0.03
Iron	4.6	19	17.7	0.73	26	31
Lead						0.03
Magnesium	33	39	36	30	35.3	54
Manganese	1.02	1.26	0.79	0.65	1.3	1.49
Mercury				0.0001		
Nickel				0.02		0.1
Phosphorus				0.02	0.62	1.2
Potassium	6.6	5.7	4.5	6	6.2	6.4
Silver						
Sodium	21	24	12	26	15.2	19
Zinc	0.85		0.18	0.8		0.7
PCBs	-	-	-			
Chlordane (ppb)	-	-	-	-		[illegible]

NOTE: All results in ppm unless otherwise noted
Blanks indicate below detection limit
- Indicates parameter not analyzed
Sample x301 was collected from basement seepage

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TABLE 8-11: INORGANIC ANALYSIS OF GROUND WATER AND SOIL SAMPLES IN THE VICINITY OF CREEK SECTOR B (COLLECTED BY USEPA 3-3-82)

SAMPLE LOCATIONS

PARAMETERS	GROUND WATER - in PPB S01	S02	S03	S04	S05	S06	SOIL IN PPM S07	S010	S011	R012
Aluminum		800	300		900	1,200	750	600	430	
Antimony										
Arsenic	11			29			1.3	1.0		
Barium							80	80	80	
Beryllium										
Boron	10,500	11,000	8,000	1,800	140	110				
Cadmium	4.2	14	31	5.3		2.8	1.06	1.64	0.29	
Chromium	12						2.2			3.2
Cobalt	62	70	82	95						
Copper	65						16	24	13	
Iron	65,000	31,000	38,000	28,000	530	250	340	360	240	
Lead	570	97	74	9	11	10	(45)	(20)	(25)	
Manganese	1,600	1,100	1,500	5,100	440	80	120	630	134	
Mercury										
Mercury*	0.1	0.4	0.4	0.2	0.1					
Nickel							6.5	5.5	4	
Selenium										
Silver										
Thallium										
Tin									2	
Vanadium										
Zinc	107,000	109.000	40,000	1,900	260	350	96	77	130	

NOTE: Blanks indicate below detection limits
( ) - Results did not meet USEPA Quality Control criteria - Data unreliable
* Duplicate analysis performed by USEPA central regional laboratory
Samples R09 and R012 are water and soil blanks, respectively

A USEPA Field Investigation Team (FIT) contractor also performed an air monitoring survey in the creek bed in March, 1982. This survey involved the use of an organic vapor analyzer (OVA), an HNU photoionizer, and Drager detector tubes for phosgene gas. Results indicated that a small, but measurable, concentration of organic vapors were present in the breathing zone (5 feet above ground surface), with concentrations increasing closer to the creek bed. In the breathing zone, the OVA showed readings up to 0.5 ppm above background, and the HNU readings were as high as 9 ppm above background. The survey crew also observed a 3-inch effluent pipeline adjacent to the former Waggoner Building which was discharging a small stream of oily liquid. OVA and HNU readings were taken approximately 6 inches from the surface where this liquid had pooled. The OVA showed concentrations up to 350 ppm, and the HNU showed concentrations ranging from 400 to 900 ppm in this area. Phosgene gas was not detected in any area using the Drager tubes.

HRS scores have been calculated on two separate occasions for Dead Creek. The creek was first scored in July, 1982, by Ecology & Environment, Inc., with a final migration score of 18.48. The site was again scored in March, 1985 by IEPA in an attempt to increase the previous score. IEPAs assessment led to a final score of 29.23, however, this score has not been finalized by USEPA. Route scores for the 1982 assessment were as follows: ground water 4.24, surface water 7.55, and air 30.77. Corresponding route scores in the 1985 assessment were 5.65, 10.07, and 49.23. Observed releases were used for all route scores in both the 1982 and the 1985 scoring packages. The only difference in the assessments was in the value assigned for waste quantity in the three routes. The 1982 package listed waste quantity as unknown (assigned value - 0), while IEPA calculated an approximate volume of waste based on sample results and visual observations.

A significant amount of data has been developed showing a wide range of contaminants in and around CS-B. Review of existing file data indicates numerous possible sources of contamination in the area.

CER 051592

E000530

sediment and subsurface soil samples from several locations in the creek bed and along the banks. The hydrology of the area has not been well-defined and should be addressed further. It has not been established whether the ground water discharges to Dead Creek or the creek acts as a recharge conduit for the Henry Formation aquifer. If discharge to the creek is occurring, the subsurface disposal areas (Sites H and I in particular) may be major contributors to the contamination of the creek.

Accordingly, existing IEPA monitoring wells on both sides of the creek should be redeveloped to allow for accurate water level measurements. This, in conjunction with detailed surveying of the creek bed and water levels in the creek, would allow adequate assessment of the hydrology in the area. This would be best accomplished using continuous-recording water level instrumentation, and should be continued over a period of time sufficient to address seasonal fluctuations. In addition, records of industries in the area should be thoroughly reviewed to establish a profile of possible releases from each source.

SECTORS C THROUGH F - DEAD CREEK

Site Description

Creek Sectors C through F include the entire length of Dead Creek south of Judith Lane. This portion of the creek flows south-southwest through the Village of Cahokia prior to discharge into the Prairie DuPont floodway. The floodway subsequently discharges into the Cahokia Chute of the Mississippi River. The creek is somewhat wider through these sectors than in sectors A and B, and is not as heavily vegetated as Sector B. Creek Sectors C through F are delineated as follows: CS-C- Judith Lane to Cahokia Street, CS-D - Cahokia Street to Jerome Street, CS-E - Jerome Street to the intersection of State Route 3 and State Route 157, CS-F - intersection (as above) to the discharge point in the old Prairie DuPont Creek.

Site History and Previous Investigations

There are no known discharges to Dead Creek south of Judith Lane, although several apparent discharge pipes have been observed during preliminary reconnaissance. Site N of the Dead Creek Project is located immediately east of the creek in the southern portion of CS-C. Land use in the vicinity of Sectors C through F is residential/commercial for the most part. The creek flows underground through a culvert in the southern part of CS-E near Parks College. Although the Culvert under Judith Lane has reportedly been blocked, flow emanating from the culvert has been observed on several occasions.

IEPA collected five sediment and two surface water samples from creek Sectors C through F as part of their Preliminary Hydrogeological Study conducted in 1980. Locations of these samples are shown in Figure C-1, and analytical data is presented in Table C-1. The water samples showed very little evidence of contamination, although concentrations of copper exceeded the IEPA's water quality

CER 051594

TABLE C-1: ANALYSIS OF SURFACE WATER AND SEDIMENT SAMPLES FROM CREEK SECTORS C THROUGH F (COLLECTED BY IEPA 9-25-80)

	SAMPLE LOCATIONS						
	Water		Sediment				
PARAMETERS	S301	S302	x101	x102	x103	x104	x105
Aluminum			12,000				
Arsenic	0.008	0.006	26				
Barium	0.12	0.08	1,300	4,700	210	390	475
Beryllium	-	-	-	3	-	2	-
Boron	0.06	0.04	-	76	-	-	-
Cadmium	-	-	-	50	8	31	2
Calcium			24,000	5,300	210,000	16,000	13,000
Chromium	-	0.01	400	50	60	50	-
Cobalt			40	32	6	8	9
Copper	0.26	0.04	15,000	17,200	320	1,800	360
Iron	0.66	0.87	57,000	110,000	11,000	19,000	18,000
Lead	-	-	800	1,300	260	250	75
Magnesium	3	2	7,100	2,000	10,000	5,100	3,300
Manganese	0.03	0.12	600	170	210	160	200
Mercury			1.2				
Nickel	0.05	0.01	2,000	2,300	45	600	-
Phosphorus	0.19	0.2		6,200	720	1,200	4,200
Potassium	6.6	3.3	2,400	900	1,400	2,100	1,400
Silver	-	-	-	45	10	-	-
Sodium	3	3	800	1,100	100	190	125
Strontium	0.08	0.07	100	140	210	47	43
Vanadium	-	-	-	50	22	31	35
Zinc	0.24	-	12,000	21,000	900	5,600	780
PCB	-	-	0.12	0.12	2.8	2	-

NOTE: All results in ppm.
Blanks indicate parameter not analyzed.
- Indicates below detection limits.

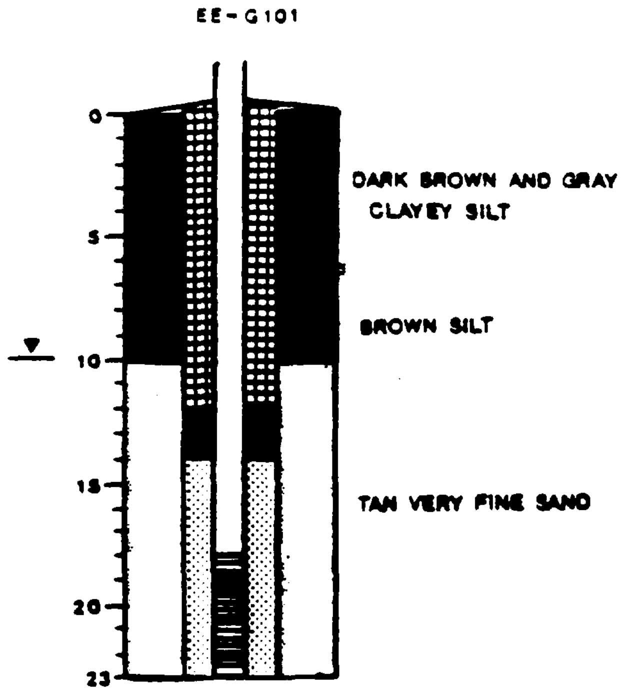
proposed provided assumptions regarding chemical profiles are made. However, in order to accurately estimate waste quantities and define to what depth contamination has occurred, a more detailed sampling program is necessary. This would include developing a depth profile of chemical constituents in the creek bed. Cores should be taken from upstream and downstream locations, with additional sampling at point sources as necessary.

APPENDIX B

BORING LOGS AND MONITORING WELL DATA

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-25-87
Prepared by Kevin Phillips

Depth (ft) Description



(IEPA well replaced)
Boring/Well No. EE-G101
Location Site G
Owner IEPA
Top of Inner Casing Elev. 412.35
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/25 2/25/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 23 ft.
Casing and Screen Diam. 2 in.
Screen Interval 18 - 23 ft.
Screen Type stainless steel 0.01" slot
Stickup 2.51 ft.
Well Type monitoring
Well Construction:
Filter Pack 22.5 - 14 ft.
Seal 14 - 12 ft.
Grout 12 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 396.86 Date 3-26-87
Static Water Elev. 398.22 Date 5-11-87
Slug Test Yes X No
Test Date 5-12-87
Hydraulic Conductivity 1.3 x 10 cm/sec
Other pH = 7.0
Cond. = 1600 umhos Temp. = 58° F
Cloudy, yellowish

WATER QUALITY

Samples Taken Yes X No
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-17-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes No X
Recipient

Comments

REMARKS

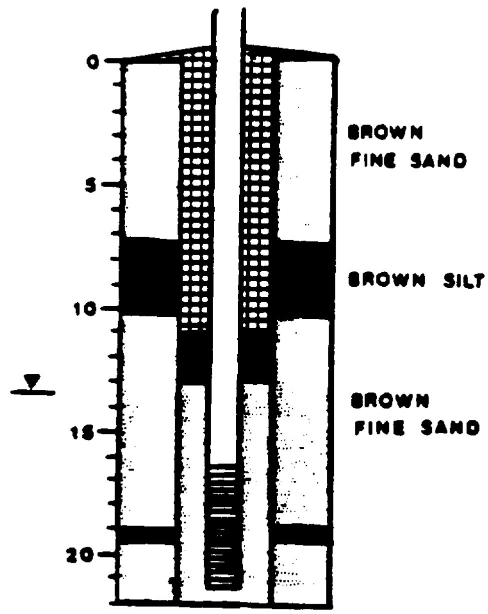
CER 051598

E000556

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-26-87
Prepared by Kevin Phillips

Depth (ft) Description

EE-G102



(IEPA well replaced)
Boring/Well No. EE-G102
Location Site G
Owner IEPA
Top of Inner Casing Elev. 409.13
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/26, 2/26/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 21.5 ft.
Casing and Screen Diam. 2 in.
Screen Interval 16.5 - 21.5 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.22 ft.
Well Type monitoring
Well Construction:
Filter Pack 22 - 13 ft. Natural
Seal 13 - 11 ft.
Grout 11 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.37 Date 3-26-87
Static Water Elev. 398.57 Date 5-11-87
Slug Test Yes X No
Test Date 5-12-87
Hydraulic Conductivity 1.6 x 10 cm/sec
Other pH = 6.8
Cond. = 1000 umhos Temp. = 56° F
Clear to yellowish

WATER QUALITY

Samples Taken Yes X No
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-24-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes No X
Recipient

Comments

REMARKS

IEPA well

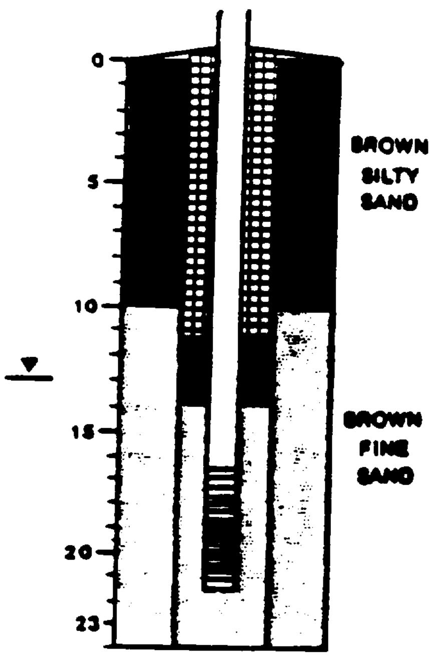
CER 051599

E000557

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-26-87
Prepared by Kevin Phillips

Depth (ft) Description

EE-G103



(IEPA well replaced)
Boring/Well No. EE-G103
Location Site G
Owner IEPA
Top of Inner Casing Elev. 408.74
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/26, 2/26/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 23.5 ft.
Casing and Screen Diam. 2 in.
Screen Interval 16.5 - 21.5 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.08 ft.
Well Type monitoring
Well Construction:
Filter Pack 22 - 14 ft. Natural
Seal 14 - 11.5 ft.
Grout 11.5 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.43 Date 3-26-87
Static Water Elev. 398.57 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 5.2
Cond. = 1200 umhos Temp. = 56° F
Cloudy, yellowish

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-17-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes ___ No X
Recipient

Comments

REMARKS

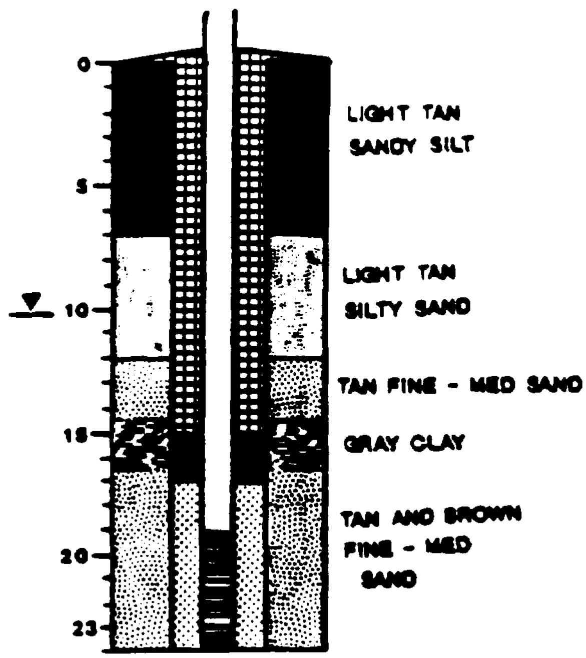
CER 051600

E000558

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-25-87
Prepared by Kevin Phillips

Depth (ft) Description

EE-G104



(IEPA well replaced)
Boring/Well No. EE-G104
Location Site G
Owner IEPA
Top of Inner Casing Elev. 408.34
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/25, 2/25/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 24 ft.
Casing and Screen Diam. 2 in.
Screen Interval 19 - 24 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.09 ft.
Well Type monitoring
Well Construction:
Filter Pack 24 - 17 ft.
Seal 17 - 15 ft.
Grout 15 ft. to surface
Lock No. 2034

TEST DATA

Static Water Elev. 397.01 Date 3-26-87
Static Water Elev. 398.24 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 6.5
Cond. = 1000 umhos Temp. = 54° F

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-17-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes ___ No X
Recipient

Comments

REMARKS

CER 051601

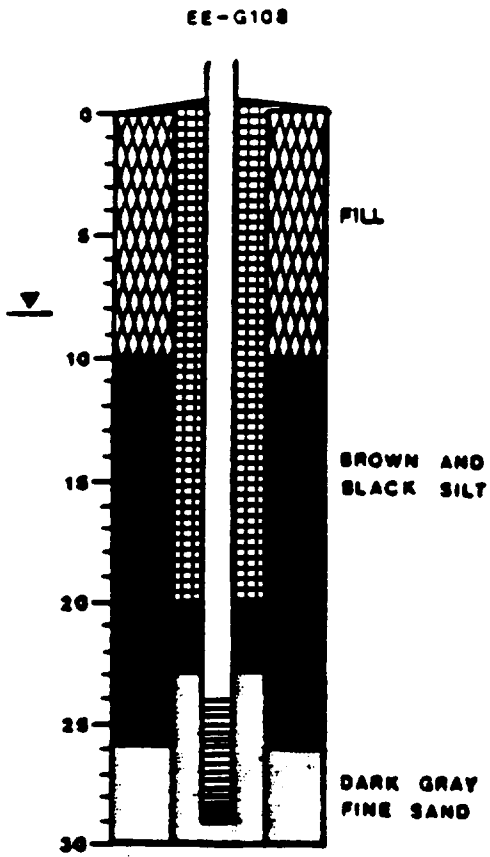
E000559

Project Name Dead Creek
Project No. IL 3140
Date Prepared 3-2-87
Prepared by Kevin Phillips

(IEPA well replaced)
Boring/Well No. EE-G108
Location Site G
Owner IEPA
Top of Inner Casing Elev. 407.22
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 3/2/87-3/2/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers

Depth (ft) Description



WELL DATA

Hole Diam. 8 in.
Boring Depth 30 ft.
Casing and Screen Diam. 2 in.
Screen Interval 24 - 29 ft.
Screen Type stainless steel 0.01" slot
Stickup 0.93 ft.
Well Type monitoring
Well Construction:
Filter Pack 29 - 22 ft.
Seal 22 - 20 ft.
Grout 20 ft. to surface
Lock No. 2034

TEST DATA

Static Water Elev. 397.96 Date 3-26-87
Static Water Elev. 398.85 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 5.4
Cond. = 1800 umhos Temp. = 56° F
Clear to cloudy No odor

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-18-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Envirospect

Comments

REMARKS

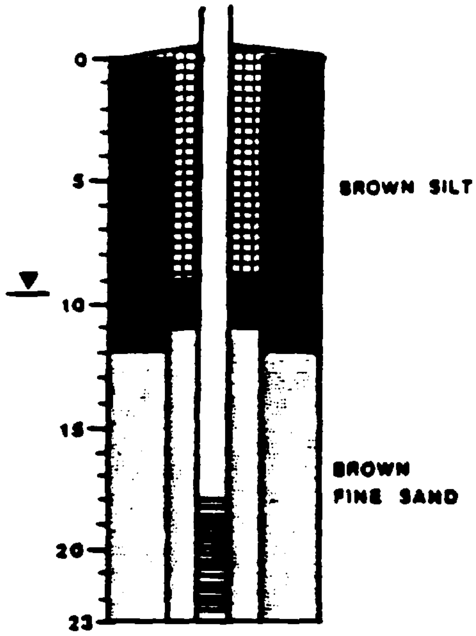
CER 051602

E000560

Project Name Dead Creek
Project No. IL 3140
Date Prepared 12-18-86
Prepared by Tim Maley

Depth (ft) Description

EE-G110



(IEPA well replaced)
Boring/Well No. EE-G110
Location Site 3
Owner IEPA
Top of Inner Casing Elev. 409.33
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 12/18-12/18/86
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 23.0 ft.
Casing and Screen Diam. 2 in.
Screen Interval 18 - 23 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.82 ft.
Well Type monitoring
Well Construction:
Filter Pack 23 - 11 ft. Natural
Seal 11 - 9 ft.
Grout 9 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.49 Date 3-26-87
Static Water Elev. 398.52 Date 5-11-87
Slug Test Yes X No
Test Date 5-13-87
Hydraulic Conductivity 5.3 x 10 cm/sec
Other pH = 6.8
Cond. = 1200 umhos Temp. = 54° F
Clear to yellowish

WATER QUALITY

Samples Taken Yes X No
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-24-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes No X
Recipient

Comments

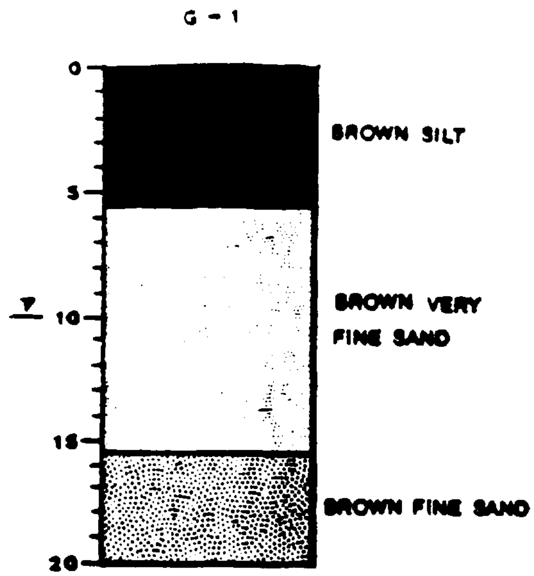
REMARKS

CER 051603

E000561

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-12-87
Prepared by Tim Maley

Depth (ft) Description



Boring/Well No. G-1
Location Site G
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/12, 1/12/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 20.0 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. ____ Date ____
Static Water Elev. ____ Date ____
Slug Test Yes ____ No ____
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes ____ No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples Yes ____ No X
Recipient

Comments Subsurface soil samples from boring 0 - 10' and 10 - 20' analyzed for HSL compounds.

REMARKS

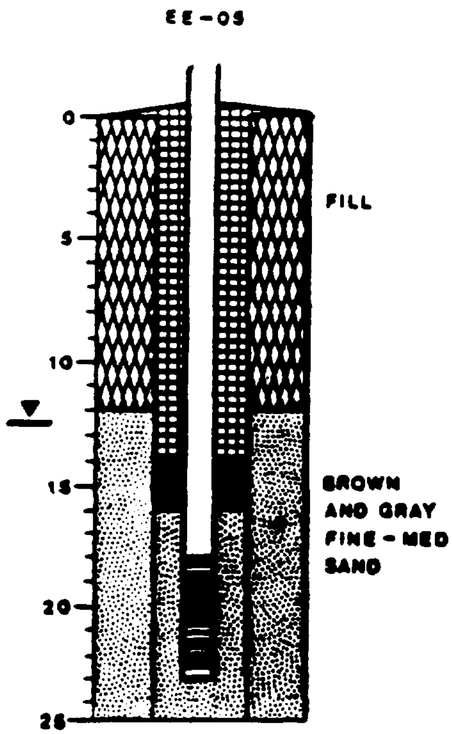
Ground elev. 407.31

CER 051604

E000562

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-14-87
Prepared by Tim Maley

Depth (ft) Description



Boring/Well No. G-1/EE-05
Location Site G
Owner IEPA
Top of Inner Casing Elev. 411.35
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/14, 1/14/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 25 ft.
Casing and Screen Diam. 2 in.
Screen Interval 18 - 23 ft.
Screen Type stainless steel 0.01" slot
Stickup 2.3 ft.
Well Type monitoring
Well Construction:
Filter Pack 23 - 16 ft.
Seal 16 - 14 ft.
Grout 14 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 396.69 Date 3-26-87
Static Water Elev. 398.17 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 5.2
Cond. = 2200 umhos Temp. = 56° F

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-18-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Envirodyne

Comments Subsurface soil sample from boring 5 - 15' analyzed for HSL compounds.

REMARKS

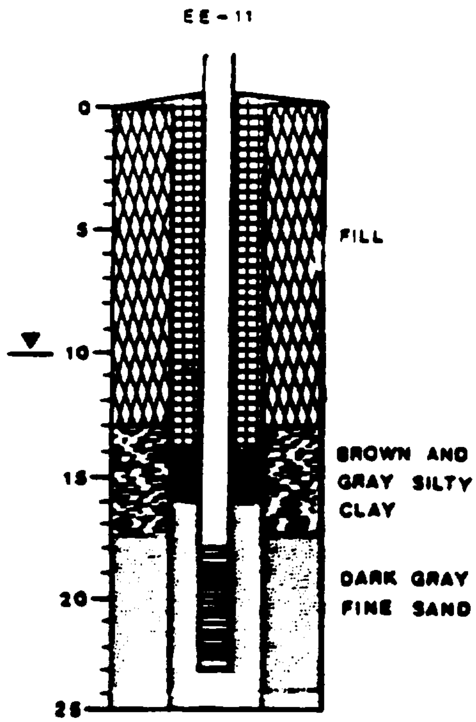
Slight organic odor

CER 051605

E000563

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-26-87
Prepared by Tim Maley

Depth (ft) Description



Boring/Well No. G-1/EE-11
Location Site G
Owner IEPA
Top of Inner Casing Elev. 409.32
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/26-1/26/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 25 ft.
Casing and Screen Diam. 2 in.
Screen Interval 18 - 23 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.57 ft.
Well Type monitoring
Well Construction:
Filter Pack 23 - 16 ft.
Seal 16 - 14 ft.
Grout 14 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.04 Date 3-26-87
Static Water Elev. 398.26 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 7.2
Cond. = 7000 umhos Temp. = 56° F
Brown to black

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-24-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 10' - 20' analyzed for HSL compounds.

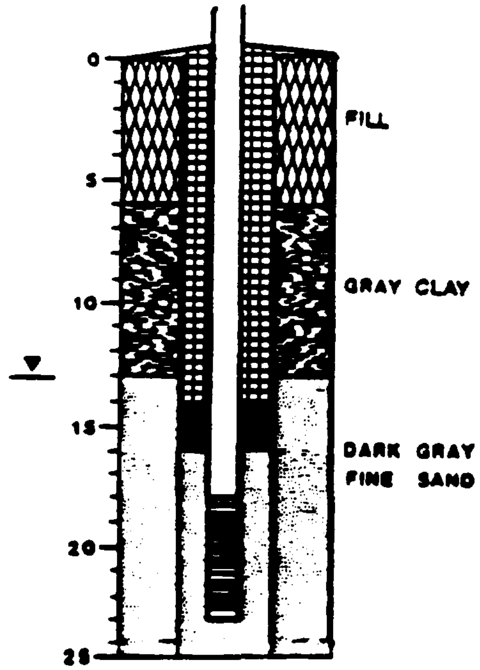
REMARKS

Slight organic odor

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-27-87
Prepared by Tim Maley

Depth (ft) Description

EE-G106



(IEPA well replaced)
Boring/Well No. G-4/EE-G106
Location Site G
Owner IEPA
Top of Inner Casing Elev. 407.97
Drilling Firm Fox drilling
Driller Jerry Hammen
Start & Completion Dates 1/26, 1/27/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 25 ft.
Casing and Screen Diam. 2 in.
Screen Interval 18 - 23 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.44 ft.
Well Type monitoring
Well Construction:
Filter Pack 23 - 16 ft. Natural
Seal 16 - 14 ft.
Grout 14 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.40 Date 3-26-87
Static Water Elev. 398.52 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 7.4
Cond. = 4200 umhos Temp. = 58° F
Dark, cloudy Strong organic odor

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-24-87
Samplers E & E
Samples Analyzed for HSL compounds, volatile organics

Split Samples Yes ___ No X
Recipient

Comments Subsurface soil samples from boring 5 - 20' analyzed for HSL compounds.

REMARKS

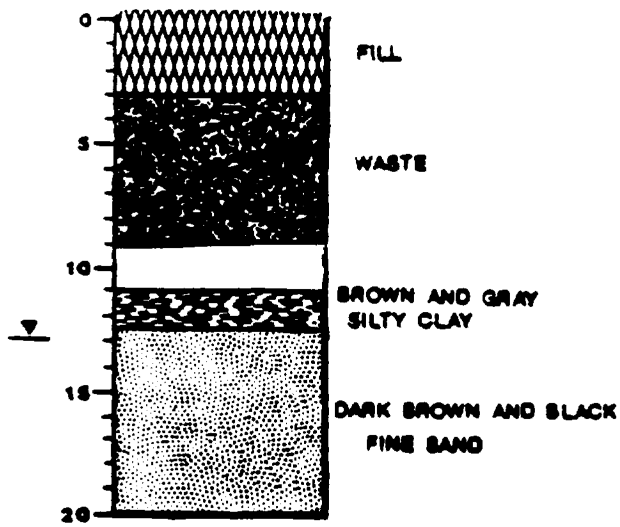
CER 051607

E000565

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-27-87
Prepared by Tim Haley

Depth (ft) Description

G - 5



Boring/Well No. G-5
Location Site 3
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox Drilling
Driller Jerry Hammon
Start & Completion Dates 1-27 1-27-87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 20.0 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. Date
Static Water Elev. Date
Slug Test Yes No
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples Yes No X
Recipient

Comments Subsurface soil samples from boring 5 - 15' analyzed for HSL compounds.

REMARKS

Ground elev. 408.02

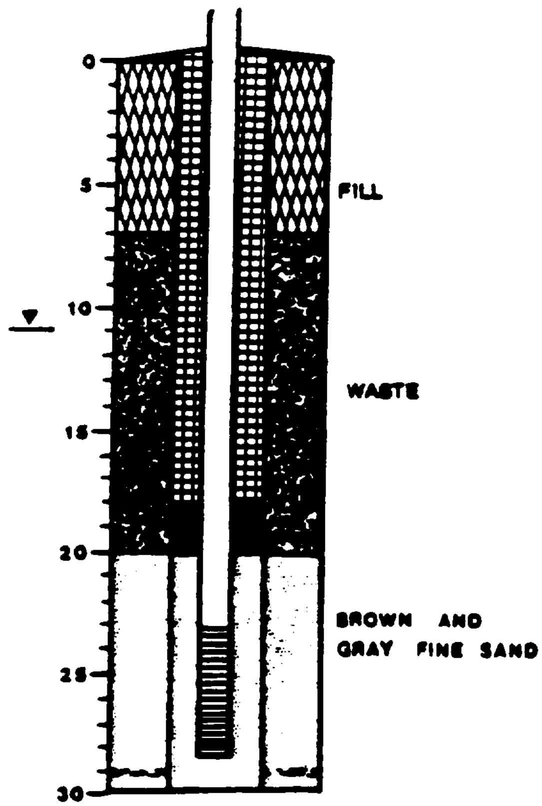
CER 051608

E000566

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-23-87
Prepared by Kevin Phillips

Depth (ft) Description

EE-G107



(IEPA well replaced)
Boring/Well No. G-6/EE-G107
Location Site 3
Owner IEPA
Top of Inner Casing Elev. 406.5'
Drilling Firm Fox drilling
Driller Jerry Hemmon
Start & Completion Dates 2/23, 2/23/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D. hollow stem augers, Rotary

WELL DATA

Hole Diam. 8 in.
Boring Depth 30 ft.
Casing and Screen Diam. 2 in.
Screen Interval 23 - 28 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.12 ft.
Well Type monitoring
Well Construction:
Filter Pack 28 - 23 ft.
Seal 20 - 18 ft.
Grout 18 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.15 Date 3-26-87
Static Water Elev. 398.32 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 6.8
Cond. = 3600 umhos Temp. = 62° F

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-18-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Envirospect

Comments

REMARKS

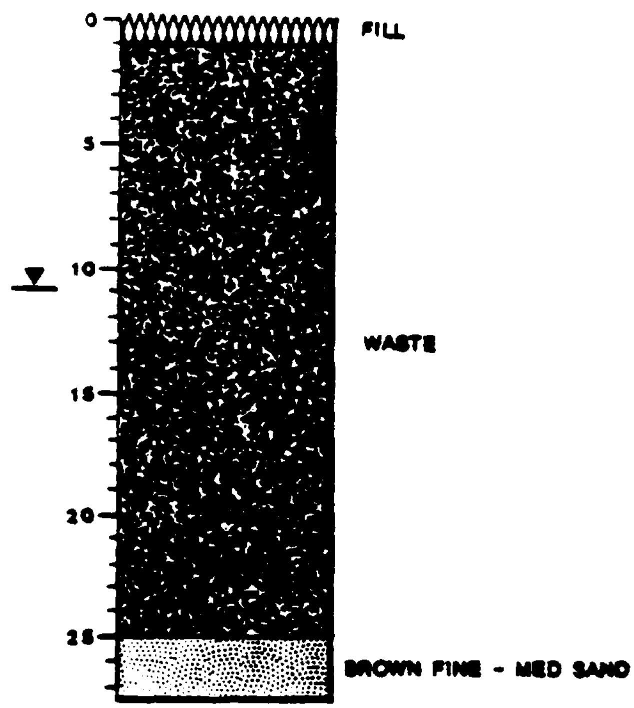
CER 051609

E000567

Project Name: Dead Creek
Project No.: IL 3140
Date Prepared: 2-24-87
Prepared by: Kevin Phillips

Depth (ft) — Description

G - 7



Boring/Well No.: G-7
Location: Site G
Owner: IEPA
Top of Inner Casing Elev.: NA
Drilling Firm: Fox drilling
Driller: Jerry Hammon
Start & Completion Dates: 2/24, 2/24/87
Type of Rig: Mobile B-61

Method of Drilling: 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam.: 8 in.
Boring Depth: 27.5 ft.
Casing and Screen Diam.:
Screen Interval:
Screen Type:
Stickup:
Well Type:
Well Construction:
- Filter Pack:
- Seal:
- Grout:
- Lock No.:

TEST DATA

Static Water Elev. ____ Date ____
Static Water Elev. ____ Date ____
Slug Test Yes ____ No ____
Test Date:
Hydraulic Conductivity:
Other:

WATER QUALITY

Samples Taken Yes ____ No X
No. of Samples:
Types of Samples:

Date Sampled:
Samplers:
Samples Analyzed for:

Split Samples Yes ____ No X
Recipient:

Comments: Subsurface soil samples from boring 18 - 25' analyzed for HSL compounds.

REMARKS

Ground elev. 407.13

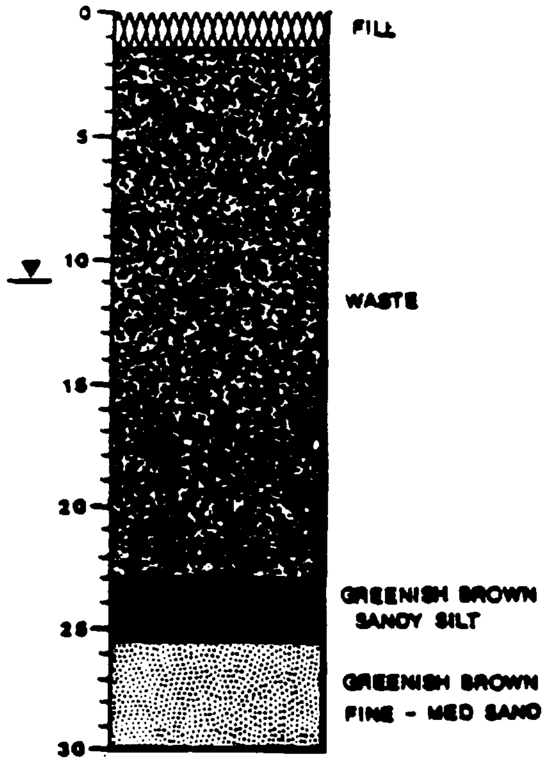
CER 051610

E000568

Project Name: Dead Creek
Project No.: IL 3140
Date Prepared: 2-24-87
Prepared by: Kevin Phillips

Depth (ft) — Description

G - 8



Boring/Well No.: G-8
Location: Site 3
Owner: IEPA
Top of Inner Casing Elev.: NA
Drilling Firm: Fox drilling
Driller: Jerry Hammon
Start & Completion Dates: 2/24, 2/24/87
Type of Rig: Mobile B-61

Method of Drilling: 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam.: 8 in.
Boring Depth: 30.0 ft.
Casing and Screen Diam.:
Screen Interval:
Screen Type:
Stickup:
Well Type:
Well Construction:
Filter Pack:
Seal:
Grout:
Lock No.:

TEST DATA

Static Water Elev. ______ Date ______
Static Water Elev. ______ Date ______
Slug Test Yes ____ No X
Test Date:
Hydraulic Conductivity:
Other:

WATER QUALITY

Samples Taken Yes ____ No X
No. of Samples:
Types of Samples:

Date Sampled:
Samplers:
Samples Analyzed for:

Split Samples Yes ____ No X
Recipient:

Comments: Subsurface soil samples from boring 10 - 20' analyzed for HSL compounds.

REMARKS

Ground elev. 406.57

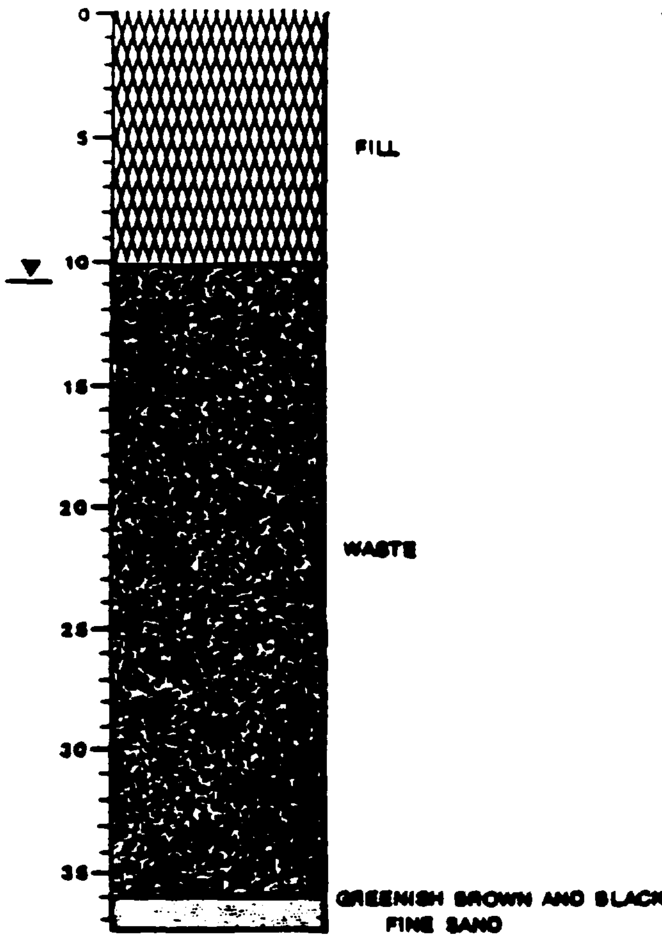
CER 051611

E000569

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-24-87
Prepared by Kevin Phillips

Depth (ft) Description

G - 9



Boring/Well No. G-9
Location Site G
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/24, 2/24 87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 37.5 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. Date
Static Water Elev. Date
Slug Test Yes___ No___
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes___ No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples Yes___ No X
Recipient
Comments Subsurface soil samples from boring 35 - 40' analyzed for HSL compounds.

REMARKS

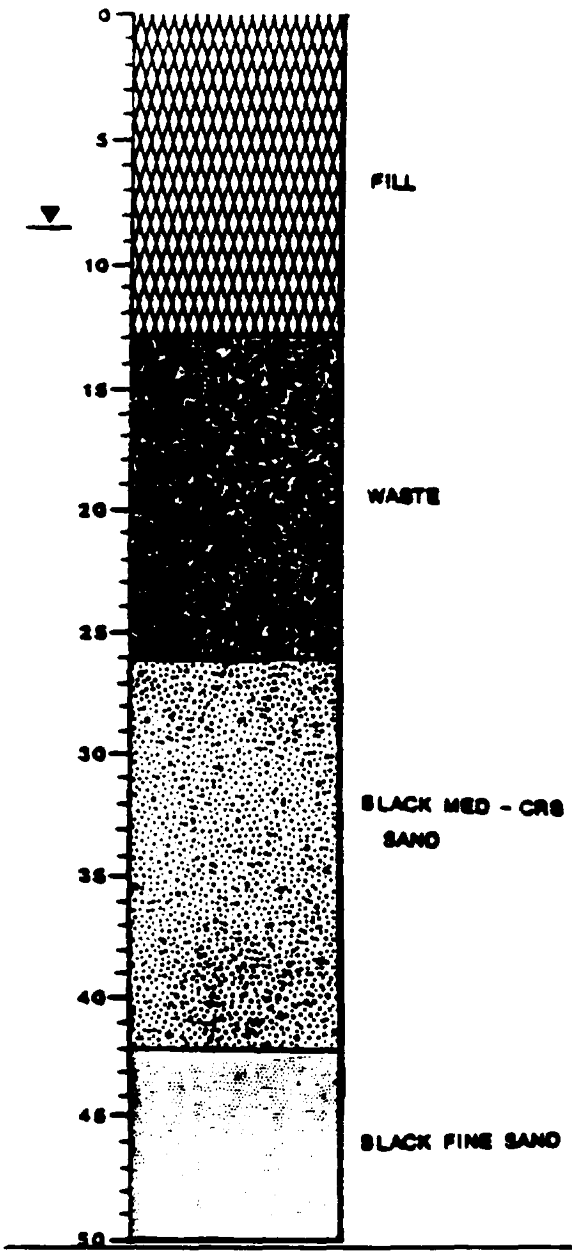
Ground elev. 407.70

CER 051612

E000570

Project Name Dead Creek
Project No. IL 3140
Date Prepared 12-18-86
Prepared by Tim Maley

Depth (ft) Description
M - 1



Boring/Well No. M-1
Location Site M
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 12-18-86
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D. hollow stem augers and rotary

WELL DATA

Hole Diam. 8 in.
Boring Depth 50.0 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. ____ Date ____
Static Water Elev. ____ Date ____
Slug Test Yes ____ No ____
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes ____ No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples Yes ____ No X
Recipient

Comments Subsurface soil samples from boring 15 - 25' and 35 - 50' analyzed for HSL compounds.

REMARKS

Strong organic odor

Ground elev. 407.29

CER 051613

E000571

Site Dead Creek Site-M   Boring/Well No. M-1 (con't)

Sample Depth	Blow Count	Description
41 - 42.5	11-19-21	Same as above to 42'. From 42' black (stained) fine grain SAND. (wet)
43.5 - 45	11-11-14	Same as above.
46 - 47.5	10-14-14	Same as above.
48.5 - 50	10-15-18	Same as above.
		E.O.B. @ 50'

CER 051614

E000572

Site Dead Creek Site-M Boring/Well No. M-2/well # EE-01

Sample Depth	Blow Count	Description
1 - 2.5	3-3-4	0-1.5 FILL consisting of black cinders and small gravel. (dry) 1.5-2.5 FILL consisting of brownish cinders, slag, and medium grain sand. (dry)
3.5 - 5	2-3-3	3.5-4 FILL - same as above. 4-5 FILL consisting of dark gray SILT. Soft and stained. Little of fine grain sand. (very moist)
6 - 7.5	35-17-19	WASTE steel and a coal-like dense black flaky substance.
8.5 - 10	2-3-3	WASTE - Wood and paper products, heavy black staining.
11 - 12.5	3-3-5	WASTE - same as above.
13.5 - 15	2-3-5	WASTE consisting of black (stained) silt, medium grain sand and wood. (wet)
16 - 17.5	4-6-9	WASTE - Wood chips.
18.5 - 20	5-7-14	WASTE - same as above.
21 - 22.5	9-10-13	WASTE - same as above.
		WASTE discontinues @ approx. 23'.
23.5 - 25	2-1-6	Firm brownish-gray fine-medium grain SAND. Black staining throughout. Well-rounded and well sorted. Rounded to subangular. (wet)
33.5 - 35	9-10-12	Dense gray fine-medium grain SAND. Trace of coarse grain sand. Fairly well sorted and rounded to subangular. (wet)
		E.O.B. @ 35

CER 051615

E000573

Site Dead Creek Site-M Boring/Well No. M-3/well #EE-02

Sample Depth	Blow Count	Description
1 - 2.5	6-10-13	<u>0-2.5</u> FILL consisting of dense brown sandy CLAY including small gravel, cinders, and brick fragments.
3.5 - 5	2-3-4	Firm brown SILT and silty CLAY. Trace of fine grain sand. (moist).
6 - 7.5	2-4-6	Firm brown to yellowish brown very sandy SILT. Some fine grain sand and trace of silty clay. (moist)
8.5 - 10	2-2-2	Same as above. (very moist)
11 - 12.5	5-11-14	Dense brownish-gray silt and fine grain SAND. (wet)
13.5 - 15	7-7-7	Same as above.
		Water table @ approx. 13 feet.
16 - 17.5	9-10-20	Very dense gray very silty fine grain SAND. Some silt. Wet.
18.5 - 20	9-10-11	(From 18 to 23 feet) tan dense very fine grain SAND. Very well sorted. Wet.
		E.O.B. @ 23 feet.

CER 051616

E000574

Site Dead Creek Site-M   Boring/Well No. M-4

Sample Depth	Blow Count	Description
1 - 2.5	6-9-12	FILL consisting of black silty CLAY and cinders, brick fragments, and medium grain sand. Dry.
3.5 - 5	2-3-10	FILL consisting of black very sandy CLAY. Some slag and black staining. Moist.
6 - 7.5	6-13-15	6-7' FILL same as above. 7-7.5' WASTE Very heavy black oil or tar like staining (approximately 3 inches thick)
8.5 - 10	4-5-2	8.5-9 FILL consisting of brown silty CLAY. 9-10 WASTE Black (heavily stained) sludge-like material with a trace of flecks. Very moist.
11 - 12.5	2-3-2	WASTE black sludge. Wet.
13.5 - 15	3-2-2	WASTE same as above, including hard small spherical beads (1/8" dia.), and paper products. Wet with a visible oily sheen.
16 - 17.5	2-2-2	WASTE same as above, including granular material and broken glass fragments. (Some of the glass fragments appeared to have a threaded top such as a sample jar). Wet.
18.5 - 20	3-4-5	WASTE same as above, including a greenish-yellow jelly like material. Wet with an oil or tar like substance adhering to the spoon.
21 - 22.5	9-16-11	WASTE same as above, including a white granular material veined with brownish-red, glass fragments, and burnt wood. Wet.
23.5 - 25	2-2-15	WASTE consisting of multi-colored (red, green, brown, black, and white) materials; including a chunk of a waxy white substance that breaks into flakes. WASTE discontinues @ approx. 26'.
26 - 27.5	10-15-17	Firm brownish-gray fine grain SAND. Some silt. Wet. Very clayey @ 26'-26.5'.
28.5 - 30	1-1-1	Very loose brown fine grain SAND. Trace of medium to coarse grain sand. Very well sorted. Wet.

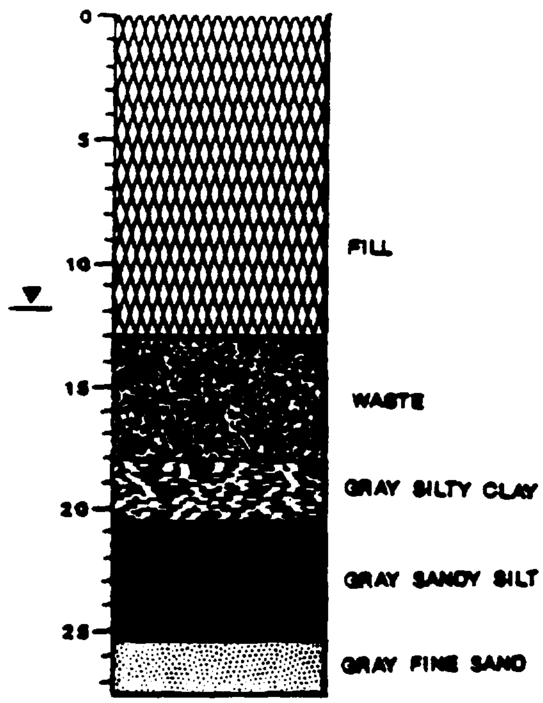
CER 051617

E000575

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-7-87
Prepared By Kevin Phillips

Depth (ft) Description

H - 5



Boring/Well No. H-5
Location Site H
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox Drilling
Driller Jerry Hammon
Start & Completion Dates [illegible]
Type of Rig Mobile B-61

Method of Drilling 3 1/4" [illegible]
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 27.5 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. Date
Static Water Elev. Date
Slug Test Yes No
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples Yes No X
Recipient

Comments Subsurface soil samples from boring 0 - 10' analyzed for HSL compounds.

REMARKS

Ground elev. 409.75

CER 051618

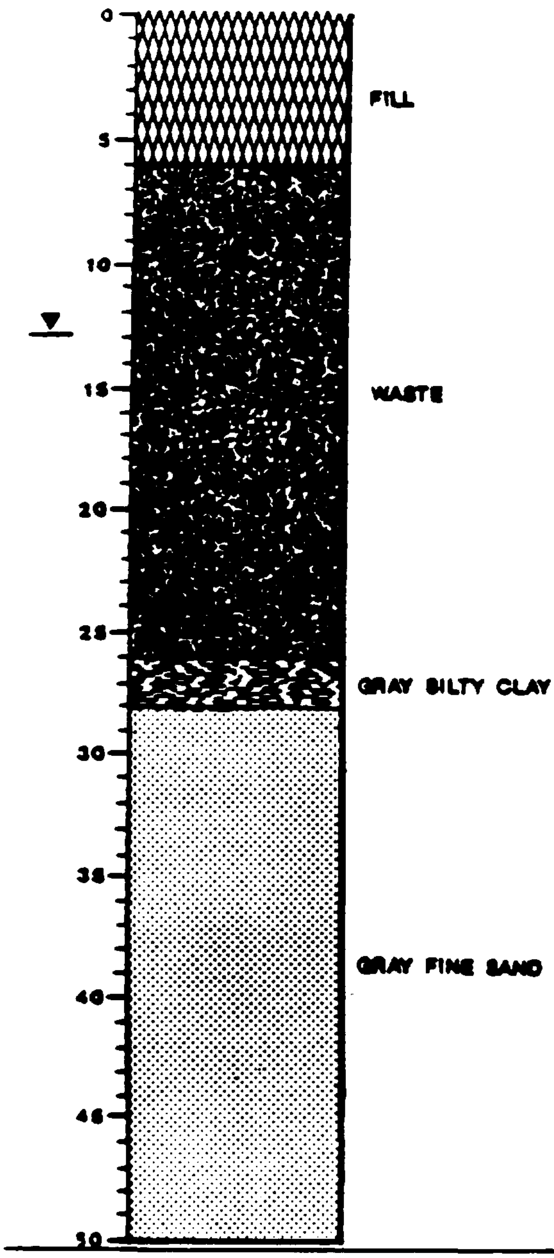
E000576

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-7-87
Prepared by Kevin Phillips

Boring/Well No. H-6
Location Site H
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/7 & 1/7 87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D. hollow stem augers and rotary

Depth (ft) H – 6 Description



WELL DATA

Hole Diam. 8 in.
Boring Depth 50.0 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. Date
Static Water Elev. Date
Slug Test Yes No
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples Yes No X
Recipient

Comments Subsurface soil samples from boring 35 - 50' analyzed for HSL compounds.

REMARKS

Ground elev. 408.19

CER 051619

E000577

Site Dead Creek Site-N — Boring/Well No. H-6 cont.

Sample Depth	Blow Count	Description
5 foot sample interval from 30'.		
33.5 - 35	9-12-18	Same as above.
38.5 - 40	12-20-24	Gray very dense fine to coarse grain SAND. Wet.
43.5 - 45	15-22-28	Light gray very dense fine grain SAND. Trace of silt. Well sorted. Wet.
48.5 - 50	10-10-17	Same as above.
		E.O.B. @ 50'.

CER 051620

E000578

Site Dead Creek Site-M   Boring/Well No. M-7

Sample Depth	Blow Count	Description
1 - 2.5	12-14-16	FILL consisting of black silty CLAY with crushed limestone and brick fragments. Dry. Fill discontinues @ approx. 3'.
3.5 - 5	2-4-5	Gray stiff very silty CLAY. Trace of fine grain sand. Moist. Chemical odor.
6 - 7.5	3-2-3	Same as above. Some black and dark gray staining. Gasoline odor.
8.5 - 10	3-4-6	Same as above. No staining. Slight odor.
11 - 12.5	2-3-4	Brown and gray (mottled) firm very silty CLAY. Occasional silt stringers. Moist. No odor.
13.5 - 15	3-3-4	Same as above. Water @ 15.5'.
16 - 17.5	1-1-2	Brownish-gray loose fine grain SAND. Some silt. Occasional iron stained pockets. Wet.
18.5 - 20	1-1-5	Brown loose fine to medium grain SAND. Trace of silt. Well sorted and rounded. Wet. Start sampling interval @ 20'.
23.5 - 25	3-8-14	Reddish-brown dense coarse grain SAND. Trace of small gravel. Some fine to medium grain sand. Poorly sorted and well rounded. Black stained sand seam (2") @ 24.5'. Wet.
28.5 - 30	7-9-13	Grayish-brown dense fine to medium grain SAND. Well rounded and sorted. Wet.
33.5 - 35	12-12-14	Brown dense fine grain SAND. Trace of medium grain sand. Well sorted and rounded. Wet.
38.5 - 40	8-12-20	Gray very dense fine grain SAND. Occasional natural organic layers. Wet.
43.5 - 45	10-25-30	Natural wood. (apparently drill and sample a buried tree @ 43')
48.5 - 50	7-9-7	Gray firm fine to coarse grain SAND. Rounded, wet.
		E.O.B. @ 50'

CER 051621

E000579

Site Dead Creek Site-H　　Boring/Well No. H-8/well #EE-03

Sample Depth	Blow Count	Description
		0-1.5 Black cinders
1 - 2.5	4-5-7	1.5-2.5 Brown and gray silty CLAY. Trace of small gravel, brick, and concrete fragments.
3.5 - 5	4-5-1	FILL same as above.
6 - 7.5	8-12-11	FILL consisting of black and gray silty CLAY (possibly stained). 2 inches of black granular material and small spherical beads @ 7'. WASTE (moist)
8.5 - 10	30/2	WASTE - no recovery (rod bounced, probably rubber material).
		Water @ 11' while drilling.
11 - 12.5	1-1-1	Gray very sandy SILT. Some fine grain sand. Wet. Slight chemical odor.
13.5 - 15	2-3-5	Gray firm very sandy silty CLAY. Some fine grain sand and silt. Horizontally bedded and slightly varved. Occasional fractures containing iron-like staining. Moist.
16 - 17.5	1-2-3	Same as above; bedding is 1/8" to 1/4" thick. Occasional fractures and root trails or burrows.
18.5 - 20	1-1-1	Gray loose very clayey SILT, some fine grain sand. No bedding. Wet.
21 - 22.5	1-2-3	Same as above; slightly bedded (1/8") and slightly varved.
23.5 - 25	1-1-1	Same as above.
26 - 27.5	3-4-7	Same as above. (Fine grain sand in tip of spoon).
28.5 - 30	6-6-10	From 27' dark gray fine grain SAND. Wet. Slight chemical odor.
33.5 -35	3-9-9	Firm gray fine to coarse grain SAND. Wet. Well rounded.
		E.O.B. @ 35'

CER 051622

E000580

Site Dead Creek Site-M Boring/Well No. M-3/well #EE-04

Sample Depth	Blow Count	Description
1 - 2.5	5-5-3	0-2' Firm brownish-gray clayey SILT. Trace of fine grain sand. Moist. 2-2.5' Firm brown sandy SILT. Some fine grain sand. Dry.
3.5 - 5	3-4-6	Stiff brown and gray (mottled) very silty CLAY. Trace of fine grain sand. Occasional clayey silt layers (2"). Moist.
6 - 7.5	3-5-8	Same as above; becomes increasingly siltier at 7' then grades into brown very fine SAND at 7 1/4'. Trace of silt. Dry.
8.5 - 10	3-5-7	Brown very fine grain SAND. Trace of silt. Dry.
11 - 12.5	2-2-5	Same as above; a 4 inch silty clay layer appears at 12'. Trace of fine grain sand.
13.5 - 15	2-6-8	Brown fine grain SAND. Wet.
16 - 17.5	2-6-7	Brown fine grain SAND. Some medium grain sand. Wet.
18.5 - 20	1-1-3	Brown medium grain SAND. Trace of coarse grain sand. Wet.
23.5 - 25	7-14-11	Brown medium grain SAND. Trace of coarse grain sand and small gravel. Wet.
		E.O.B. @ 25'

CER 051623

E000581

Site Dead Creek Site-I

Boring/Well No. I-1/Well # EE-12

Sample Depth	Blow Count	Description
		Crushed limestone and gravel on surface - parking lot for semi-trailers.
1 - 2.5	5-6-7	FILL consisting of brown-black sandy CLAY including a mixture of asphalt, fine to coarse grain sand, large gravel, and slag. Dry.
3.5 - 5	3-4-6	WASTE consisting of brown-black gravelly SAND including slag, stained paper and wood products, and a white gravelly substance. Dry.
6 - 7.5	3-5-4	WASTE. Same as above; with more slag and small spherical beads. Dry.
8.5 - 10	7-2-1	WASTE - poor recovery; probably same as above.
11 - 12.5	4-2-1	WASTE - same as above; wet.
13.5 - 15	7-10-14	WASTE consisting of black (oily stained) sludge-like material including wood chips, coarse grain sand, and concrete fragments. Wet.
16 - 17.5	1-3-4	WASTE. Same as above; with brick and concrete fragments, sand and gravel, and soft clay. Wet.
18.5 - 20	4-3-1	WASTE. Same as above. Fill material discontinues @ 21'.
21 - 22.5	0-0-2	21-22' Dark gray fine grain SAND. Some black staining. Wet. 22-22.5 Dark gray silty CLAY. Moist.
23.5 - 25	2-1-1	Dark gray silty CLAY. Moist.
26 - 27.5	0-0-1	Dark gray to black fine grain SAND. Trace of silt and medium grain SAND. Wet.
28.5 - 30	6-8-10	Dark gray medium to coarse grain SAND. Wet.
31 - 32.5	7-8-9	Same as above; with a trace of small gravel. Wet.
		E.O.B. @ 33.5'

CER 051624

E000582

Site Dead Creek Site-I   Boring/Well No. I-2

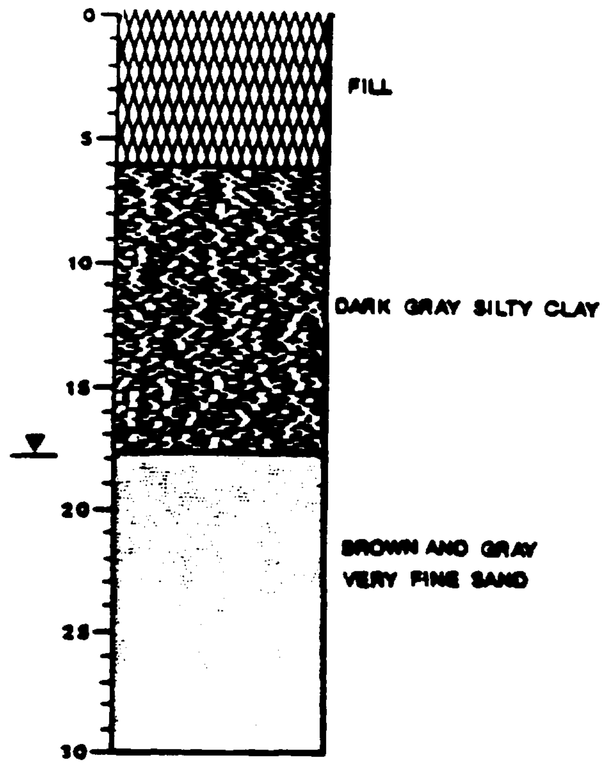
Sample Depth	Blow Count	Description
		Crushed limestone parking lot surface.
1 - 2.5	3-6-9	FILL consisting of black sandy CLAY including a mixture of fine-medium grain sand, asphalt, cinders, gravel, and slag. Dry.
3.5 - 5	1-1-2	FILL - same as above.
6 - 7.5	3-6-4	FILL consisting of black-brown silty CLAY. Trace of fine grain sand (in seams) @ 7'. Including some slag and wood particles. Dry.
8.5 - 10	3-2-2	WASTE consisting of light brown silty CLAY (to 9') including very loose black cinder material and medium grain sand. Dry.
11 - 12.5	51-11/1	WASTE - spoon refusal - probably a large obstruction in fill material. Wet.
13.5 - 15	2-2-2	WASTE consisting of black oily stained sludge-like material. Including fine to coarse grain sand, cinders, clay, and stained wood. Wet (with oily sheen).
16 - 17.5	16-7-6	WASTE. Same as above; with more wood particles.
18.5 - 20	0-1-2	WASTE - poor recovery - probably same material.
21 - 22.5	7-8-10	WASTE - same as above.
		Fill discontinues @ approx. 23.5'.
23.5 - 25	4-6-8	Black (stained) and gray SILT. Some very fine grain sand. Wet (with oily sheen).
26 - 27.5	2-3-2	Gray fine grain SAND. Some black staining. Wet.
28.5 - 30	9-7-3	Same as above.
31 - 32.5	11-11-11	Gray fine grain SAND. Interbedding of finer silty sand and coarser sand with small gravel; (approx. 4 inch layers). Wet.
33.5 - 35	5-10-12	Same as above.

CER 051625

Project Name Dead Creek
Project No. IL 3148
Date Prepared 1-29-87
Prepared by Tim Maley

Depth (ft) Description

I - 3



Boring/Well No. I-3
Location Site I
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/29, 1/29/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 30.0 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. Date
Static Water Elev. Date
Slug Test Yes No
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples(soil)Yes X No
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 5 - 15' analyzed for HSL compounds.

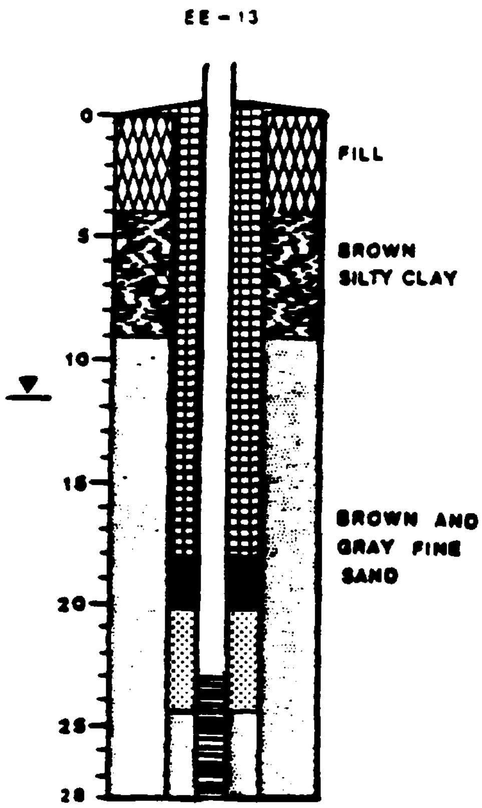
REMARKS

CER 051626

E000584

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-29-87
Prepared by Tim Maley

Depth (ft) Description



Boring/Well No. I-4/EE-13
Location Site I
Owner IEPA
Top of Inner Casing Elev. 409.16
Drilling Firm Fox Drilling
Driller Jerry Hammon
Start & Completion Dates 1/29-1/29/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 28.0 ft.
Casing and Screen Diam. 2 in.
Screen Interval 23 - 28 ft.
Screen Type stainless steel 0.01" slot
Stickup 0.52 ft.
Well Type monitoring
Well Construction:
Filter Pack 28 - 20 ft.
Seal 20 - 18 ft.
Grout 18 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.47 Date 3-26-87
Static Water Elev. 398.75 Date 5-11-87
Slug Test Yes X No
Test Date 5-12-87
Hydraulic Conductivity 1.3 x 10 cm/sec
Other pH = 7.2
Cond. = 1800 umhos Temp. = 56° F
Clear to yellowish

WATER QUALITY

Samples Taken Yes X No
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-23-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No
Recipient Sverdrup, Inc. for Cerro Copper

Comments

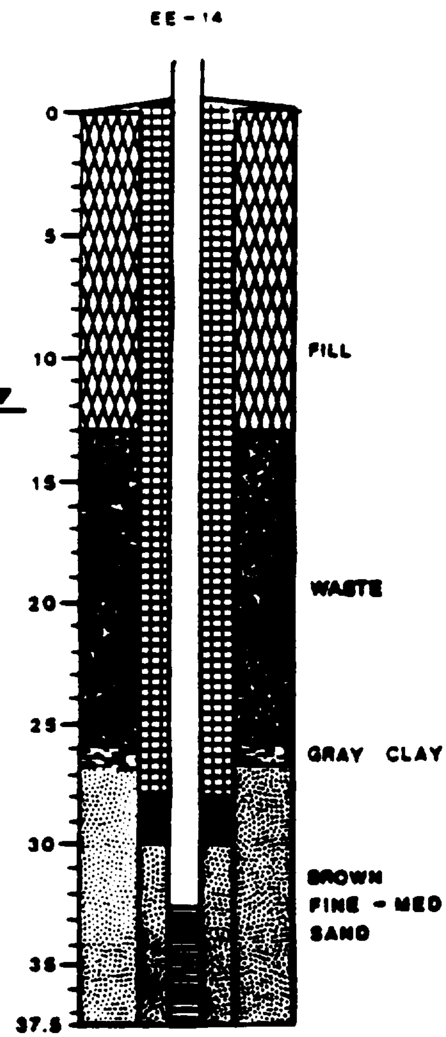
REMARKS

CER 051627

E000585

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-30-87
Prepared by Tim Maley

Depth (ft) Description



Boring/Well No. I-5/EE-14
Location Site I
Owner IEPA
Top of Inner Casing Elev. 413.35
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/30, 1/30/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D.
hollow stem augers, Rotary

WELL DATA

Hole Diam. 8 in.
Boring Depth 37.5 ft.
Casing and Screen Diam. 2 in.
Screen Interval 32.5 - 37.5 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.56 ft.
Well Type monitoring
Well Construction:
Filter Pack 37.5 - 30 ft. Natural
Seal 30 - 28 ft.
Grout 28 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.23 Date 3-26-87
Static Water Elev. 398.55 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 7.4
Cond. = 3400 umhos Temp. = 56° F
Cloudy, yellowish

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-23-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 5' - 27.5 feet and 28.5 - 37.5 feet analyzed for HSL compounds.

REMARKS

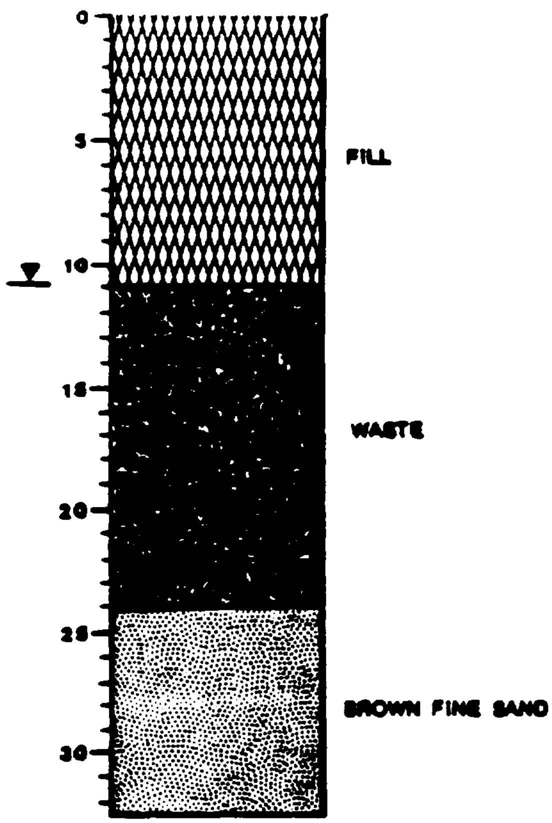
CER 051628

E000586

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-2-87
Prepared by Tim Maley

Depth (ft) Description

I - 6



Boring/Well No. I-6
Location Site I
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/2 & 2/2/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 32.5 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. ______ Date ______
Static Water Elev. ______ Date ______
Slug Test Yes ______ No ______
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes ______ No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples(soil) Yes X No ______
Recipient Sverdrup, Inc. for Cerro Copper
Comments Subsurface soil sample from boring 10 - 25' analyzed for HSL compounds.

REMARKS

Ground elev. 408.30

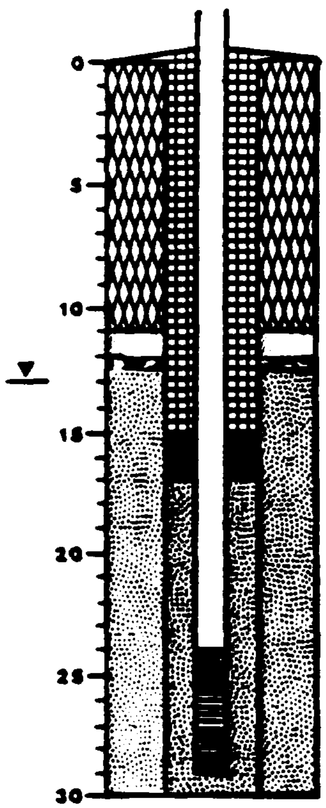
CER 051629

E000587

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-3-87
Prepared by Tim Maley

Depth (ft) Description

EE-15



Boring/Well No. I-7/EE-15
Location Site I
Owner IEPA
Top of Inner Casing Elev. 406.41
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/3/87,2/3/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D.
hollow stem augers. Rotary

WELL DATA

Hole Diam. 8 in.
Boring Depth 30 ft.
Casing and Screen Diam. 2 in.
Screen Interval 24 - 29 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.33 ft.
Well Type monitoring
Well Construction:
Filter Pack 29 - 17 ft. Natural
Seal 17 - 15 ft.
Grout 15 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.63 Date 3-26-87
Static Water Elev. 398.93 Date 5-11-87
Slug Test Yes X No ___
Test Date 5-12-87
Hydraulic Conductivity 0.47 x10⁻⁴cm/sec
Other pH = 7.2
Cond. = 1800 umhos Temp. = 56° F
Yellowish

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-23-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 3.5 - 13.5 feet and 13.5 - 22.5 feet analyzed for HSL compounds.

REMARKS

Slight odor

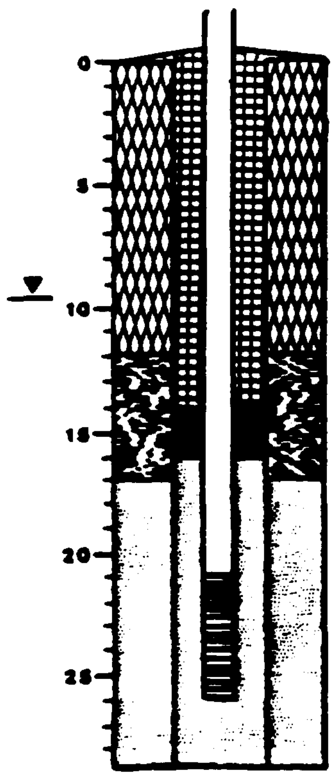
CER 051630

E000588

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-3-87
Prepared by Tim Maley

Depth (ft) Description

EE-G112



(IEPA well replaced)
Boring/Well No. I-4/EE-G112
Location Site I
Owner IEPA
Top of Inner Casing Elev. 407.87
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/3/87 2/3/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D.
hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 29.0 ft.
Casing and Screen Diam. 2 in.
Screen Interval 21 - 26 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.19 ft.
Well Type monitoring
Well Construction:
Filter Pack 26 - 16 ft. Natural
Seal 16 - 14 ft.
Grout 14 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.08 Date 3-26-87
Static Water Elev. 398.39 Date 5-11-87
Slug Test Yes X No
Test Date 5-12-87
Hydraulic Conductivity 3.4 x 10 cm/sec
Other pH = 7.6
Cond. = 1600 umhos Temp. = 58° F
Yellowish, slight odor

WATER QUALITY

Samples Taken Yes X No
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-23-87
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes No X
Recipient

Comments

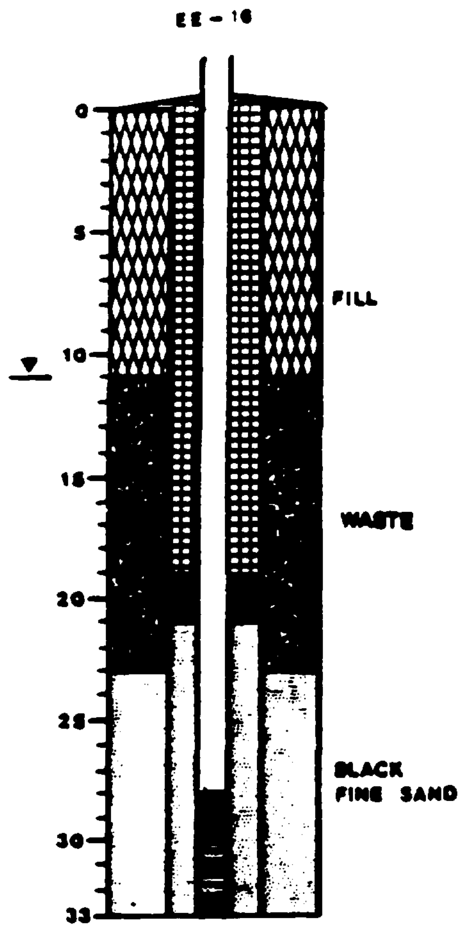
REMARKS

CER 051631

E000589

Project Name Dead Creek
Project No. IL 3140
Date Prepared 3-4-87
Prepared by Tim Haley

Depth (ft) Description



Boring/Well No. I-9/EE-16
Location Site I
Owner IEPA
Top of Inner Casing Elev. 408.65
Drilling Firm Fox drilling
Driller Jerry Hammen
Start & Completion Dates 2/4/87, 2/4/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D.
hollow stem augers, Rotary

WELL DATA

Hole Diam. 8 in.
Boring Depth 33 ft.
Casing and Screen Diam. 2 in.
Screen Interval 28 - 33 ft.
Screen Type stainless steel 0.01" slot
Stickup 1.74 ft.
Well Type monitoring
Well Construction:
Filter Pack 33 - 21 ft. Natural
Seal 21 - 19 ft.
Grout 19 ft. to surface
Lock No. 2834

TEST DATA

Static Water Elev. 397.27 Date 3-26-87
Static Water Elev. 398.56 Date 5-11-87
Slug Test Yes ___ No X
Test Date
Hydraulic Conductivity
Other pH = 7.2
Cond. = 3000 umhos Temp. = 58° F
Dark, cloudy, strong odor

WATER QUALITY

Samples Taken Yes X No ___
No. of Samples 1 round
Types of Samples groundwater

Date Sampled 3-23-86
Samplers E & E
Samples Analyzed for HSL compounds

Split Samples Yes X No ___
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 6.5 - 22.5 feet and 23.5 - 30' feet analyzed for HSL compounds.

REMARKS

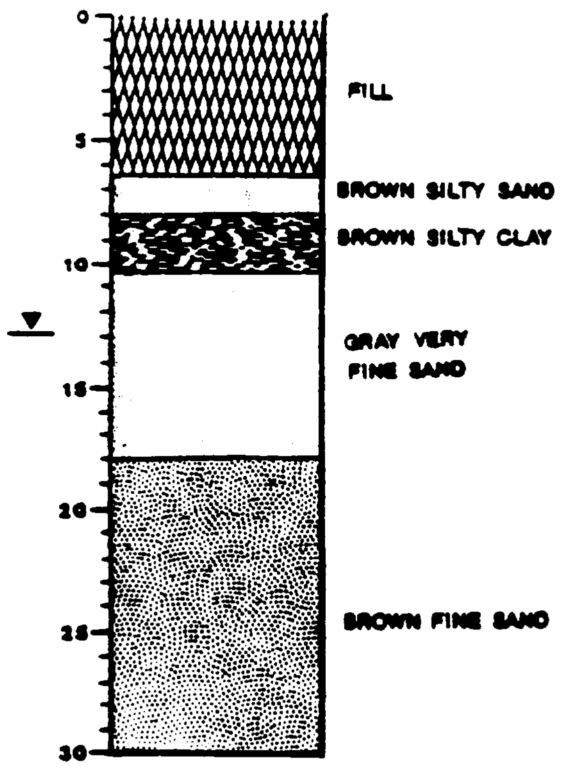
CER 051632

E000590

Project Name Dead Creek
Project No. IL 3140
Date Prepared 2-4-87
Prepared by Tim Maley

Depth (ft) Description

I-10



Boring/Well No. I-10
Location Site I
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 2/4 & 2/4/87
Type of Rig Mobile B-61

Method of Drilling 3 3/4" I.D. hollow stem augers

WELL DATA

Hole Diam. 8 in.
Boring Depth 30.0 ft.
Casing and Screen Diam.
Screen Interval
Screen Type
Stickup
Well Type
Well Construction:
Filter Pack
Seal
Grout
Lock No.

TEST DATA

Static Water Elev. Date
Static Water Elev. Date
Slug Test Yes No
Test Date
Hydraulic Conductivity
Other

WATER QUALITY

Samples Taken Yes No X
No. of Samples
Types of Samples

Date Sampled
Samplers
Samples Analyzed for

Split Samples(soil)Yes X No
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 15 - 30' analyzed for HSL compounds.

REMARKS

Ground elev. 408.68

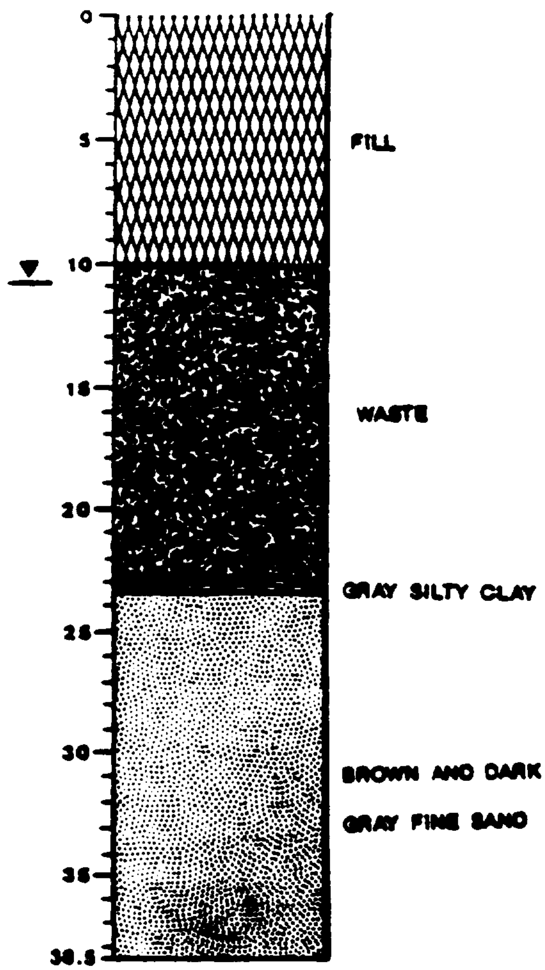
CER 051633

E000591

Project Name Dead Creek
Project No. IL 3140
Date Prepared 1-5-87
Prepared by Tim Maley

Depth (ft) Description

I - 11



Boring/Well No. I-11
Location Site I
Owner IEPA
Top of Inner Casing Elev. NA
Drilling Firm Fox drilling
Driller Jerry Hammon
Start & Completion Dates 1/5 & 1/5/87
Type of Rig Mobile B-61

Method of Drilling 3 1/4" I.D.
hollow stem augers. Rotary

WELL DATA

Hole Diam. 8 in.
Boring Depth 38.5 ft.
Casing and Screen Diam. ____
Screen Interval ____
Screen Type ____
Stickup ____
Well Type ____
Well Construction:
Filter Pack ____
Seal ____
Grout ____
Lock No. ____

TEST DATA

Static Water Elev. ____ Date ____
Static Water Elev. ____ Date ____
Slug Test Yes ____ No ____
Test Date ____
Hydraulic Conductivity ____
Other ____

WATER QUALITY

Samples Taken Yes ____ No X
No. of Samples ____
Types of Samples ____

Date Sampled ____
Samplers ____
Samples Analyzed for ____

Split Samples(soil) Yes X No ____
Recipient Sverdrup, Inc. for Cerro Copper

Comments Subsurface soil samples from boring 6 - 10' & 26 - 38.5' analyzed for HSL compounds.

REMARKS

Ground elev. 405.88

CER 051634

E000592

Site Dead Creek Site-I

Boring/Well No. I-11 cont

Sample Depth	Blow Count	Description
33.5 - 35	4-7-13	Same as above.
37 - 38.5	8-17-16	Same as above.
		E.O.B. @ 38.5'

Site Dead Creek Site-I Boring/Well No. I-12/Well #EE-20

Sample Depth	Blow Count	Description
		Dark brown sandy clay topsoil on surface.
1 - 2.5	2-3-2	Brown silty CLAY. Dry.
3.5 - 5	3-3-2	Same as above.
6 - 7.5	3-3-5	Brown fine to medium grain SAND. Dry.
8.5 - 10	3-5-8	Same as above.
11 - 12.5	3-5-8	Same as above. Moist @ 12.5'.
13.5 - 15	4-8-13	Same as above. Wet.
16 - 17.5	1-2-4	Same as above.
18.5 - 20	2-5-9	Same as above.
21 - 22.5	3-5-11	Same as above.
23.5 - 25	4-7-11	Brown medium grain SAND. Wet. Trace of coarse grain sand @ 24-25'.
26 - 27.5	7-11-20	Same as above. Trace of small gravel. Wet.
		E.O.B. @ 28'

CER 051636

E000594

Site Dead Creek Site-J

Boring/Well No. J-1

Sample Depth	Blow Count	Description
		Black foundry SAND on surface.
1 - 2.5	4-4-8	FILL consisting of black-dark brown-rust colored medium grain SAND. Trace of crushed limestone and brick fragments.
3.5 - 5	2-5-6	Foundry sand FILL to 4'. Then: Gray silty CLAY. Slightly mottled. Trace of fine grain sand.
6 - 7.5	2-2-4	Same as above.
8.5 - 10	3-3-4	Same as above. Siltier @ 10'.
11 - 12.5	3-4-6	Light brown silty SAND. Becomes sandy SILT at 12'.
13.5 - 15	2-4-5	Brown sandy SILT. Wet.
16 - 17.5	3-5-6	Same as above.
18.5 - 20	2-2-3	Dark gray sandy SILT. Some fine grain sand. Wet.
		E.O.B. @ 20'

Site Dead Creek Site-J Boring/Well No. J-1

Sample Depth	Blow Count	Description
		Black foundry sand on surface.
1 - 2.5	5-5-27	FILL consisting of black-dark gray sandy CLAY. Some foundry sand and crushed limestone fragments.
3.5 - 5	5-6-7	Same as above. Fill discontinues @ approx. 6'.
6 - 7.5	2-2-3	Gray silty CLAY. Slightly mottled. Trace of fine grain sand.
8.5 - 10	2-3-4	Same as above. Siltier and trace of small gravel @ 10'.
11 - 12.5	2-3-3	Gray fine grain sandy SILT. Wet @ 13'.
13.5 - 15	3-4-4	Same as above. Wet.
16 - 17.5	2-2-2	Same as above.
18.5 - 20	1-1-2	Same as above. Varved @ 19'.
21 - 22.5	1-1-9	Gray medium to coarse grain SAND. Trace of small gravel. Wet. Gasoline odor.
23.5 - 25	4-9-14	Same as above. Wet.
		E.O.B. @ 25'

CER 051638

E000596

Site Dead Creek Site-J　　　　Boring/Well No. J-1

Sample Depth	Blow Count	Description
		Foundry sand on surface.
1 - 2.5	4-5-8	FILL consisting of black-dark brown sandy CLAY. Trace of medium grain sand (foundry) and brick fragments.
3.5 - 5	6-9-14	Same as above. Auger refusal at 5'. Large obstruction encountered. Moved boring 6' north. Continue sampling.
6 - 7.5	2-2-3	FILL consisting of black-dark brown sandy CLAY. Trace of medium grain foundry sand and slag material. Loose and dry @ 10'.
8.5 - 10	3-3-3	Same as above.
11 - 12.5	2-2-1	Same as above. Moist.
13.5 - 15	1-2-3	Same as above. Wet.
16 - 17.5	1-2-8	Same as above. Fill discontinues @ approx. 18'.
18.5 - 20	2-5-7	Brown-gray medium grain SAND. Wet.
23.5 - 25	4-7-10	Same as above. Increased coarse grain sand.
		E.O.B. @ 25'

CER 051639

E000597

Site Dead Creek Site-K Boring/Well No. K-1

Sample Depth	Blow Count	Description
1 - 2.5	14-11-11	FILL consisting of dark brown silty CLAY. With crushed limestone and brick fragments. Trace of medium grain sand and small gravel.
3.5 - 5	2-2-1	Same as above. Moist.
6 - 7.5	1-2-1	Same as above.
8.5 - 10	2-3-6	Same as above. Slightly stained. FILL discontinues @ approx. 10.5'.
11 - 12.5	3-6-9	Gray-brown medium grain SAND. Wet. Some black staining @ 11'. Thin clay layer at 12' (-3.5").
13.5 - 15	3-5-7	Gray-brown medium grain SAND. Wet.
16 - 17.5	3-3-4	Gray-brown medium to coarse grain SAND. Trace of small gravel. Wet.
18.5 - 20	2-3-4	Same as above.
		E.O.B. @ 20'

CER 051640

E000598

Site Dead Creek Site-K　　　Boring/Well No. K-2

Sample Depth	Blow Count	Description
1 - 2.5	10-11-25	FILL consisting of brown-gray-black sandy CLAY with crushed limestone gravel, and brick fragments. Moist.
3.5 - 5	3-4-5	Same as above.
6 - 7.5	1-2-2	Same as above. Silty and soft.
8.5 - 10	2-2-1	Same as above. Trace of medium grain sand and small gravel. Very moist.
11 - 12.5	3-3-4	Same as above. Trace of wood chips. Wet. Fill discontinues @ approx. 13'.
13.5 - 15	1-6-8	Firm dark gray-gray very fine grain SAND. Well rounded and well sorted. Black streaking @ 13 3/4' (~2"). Wet.
16 - 17.5	2-4-4	Same as above. Natural black staining.
18.5 - 20	10-11-14	Same as above. Cleaner. Wet.
		E.O.B. @ 20'

CER 051641

Site Dead Creek Site-K | Boring/Well No. K-3

Sample Depth	Blow Count	Description
1 - 2.5	5-7-12	FILL consisting of brown-black silty CLAY. Some small gravel and crushed limestone fragments.
3.5 - 5	6-7-9	FILL consisting of black sandy CLAY with small gravel, slag material, asphalt, and cinders.
6 - 7.5	1-1-1	FILL consisting of black clayey SAND. Trace of small gravel. Wet.
8.5 - 10	1-2-1	Same as above.
11 - 12.5	1-2-2	No recovery.
13.5 - 15	4-10-5	FILL consisting of soft black silty CLAY. Trace of fine to medium grain sand, small gravel, and limestone fragments. Wet.
		Fill discontinues @ approx. 16.5'.
16 - 17.5	2-3-6	Gray sandy CLAY. Very moist.
18.5 - 20	1-3-4	Brown-gray fine grain SAND. Wet.
		E.O.B. @ 20'

CER 051642

Site Dead Creek Site-L

Boring/Well No. L-1

Sample Depth	Blow Count	Description
1 - 2.5	4-6-7	0-2 FILL consisting of black sandy clay with asphalt, cinders, and gravel. Fill discontinues @ approx. 2'. 2-2.5 Brown silty CLAY. Some small gravel. Moist.
3.5 - 5	4-4-3	Brown clayey SILT. Little fine grain sand. Moist.
6 - 7.5	3-3-6	Same as above.
8.5 - 10	2-2-2	Same as above. Very moist.
11 - 12.5	2-1-1	Soft gray clayey SILT. Little fine grain sand. Wet.
13.5 - 15	1-1-1	Soft brownish-gray very silty CLAY. Trace of fine grain sand. Occasional thin seams of gray clayey silt. Moist.
16 - 17.5	WOR	Loose gray fine grain SAND. Wet.
18.5 - 20	5-5-7	Same as above. Wet.
		E.O.B. @ 20'

CER 051643

E000601

Site Dead Creek Site-L Boring/Well No. L-2

Sample Depth	Blow Count	Description
		2-1 Fill on surface - black cinders.
1 - 2.5	4-12-60	FILL consisting of black silty CLAY. Trace of small gravel and concrete fragments. Moist.
3.5 - 5	8-5-7	FILL consisting of hard dark gray silty CLAY. Trace of small gravel, brick fragments, and wood chips.
6 - 7.5	2-4-6	FILL consisting of black-gray silty CLAY. Trace of small gravel and wood chips. Very moist. Stained black.
		Fill discontinues @ 8'.
8.5 - 10	2-2-3	Soft gray very sandy SILT. Some fine grain sand. Very moist. Black staining throughout.
11 - 12.5	6-7-14	Same as above.
13.5 - 15	4-8-9	Loose black sandy SILT. Some fine grain sand. Very moist.
16 - 17.5	2-2-3	Loose black fine grain SAND. Wet.
18.5 - 20	2-3-6	Same as above. Trace of silt. Wet.
		E.O.B. @ 20'.

CER 051644

E000602

Site Dead Creek Site-L

Boring/Well No. L-1

Sample Depth	Blow Count	Description
		0-1 Black cinders FILL
1 - 2.5	6-7-9	FILL consisting of stiff brown-gray silty CLAY. Trace of fine grain sand, small gravel, and brick fragments. Moist.
3.5 - 5	5-5-6	FILL consisting of stiff gray silty CLAY. Little small gravel; trace of fine grain sand, large gravel, brick fragments, and wood chips. Moist.
		Fill apparently discontinues @ approx. 6'.
6 - 7.5	2-2-3	6-6.5 Loose dark gray SILT. Stained black. 6.5-7.5 Loose brownish gray very sandy SILT. Some fine grain sand. Moist.
8.5 - 10	3-4-6	Firm, gray clayey SILT. Some brownish staining. Trace of fine grain sand. Moist. Mottled.
11 - 12.5	3-3-5	Firm black clayey SILT. Some clay. Little fine grain sand. Very moist.
13.5 - 15	3-3-5	Firm black-gray sandy SILT. Some fine grain sand. Little clay. Moist.
16 - 17.5	2-5-10	16-17 Same as above. Wet. 17-17.5 Black silty SAND. Wet.
18.5 - 20	1-2-4	Firm black fine grain SAND. Well sorted. Wet.
		E.O.B. @ 20'

CER 051645

E000603

Site Dead Creek Site-L

Boring/Well No. L-4/Well # EE-G109
IEPA Replacement Well

Sample Depth	Blow Count	Description
		0-2' FILL consisting of black asphalt and clay.
1 - 2.5	5-6-7	from 2' Brown sandy SILT. Moist.
3.5 - 5	3-3-4	Brown sandy SILT. Trace of medium grain sand.
6 - 7.5	3-4-4	6.5-7 Brown silty CLAY. Trace of fine grain sand. 7-7.5 Gray fine grain SAND. Trace of silt and clay.
8.5 - 10	3-4-6	Brown-gray (mottled) clayey SILT. Trace of fine grain sand. Moist.
11 - 12.5	4-7-8	Gray sandy SILT. Wet.
13.5 - 15	6-11-13	Same as above. Trace of fine grain sand.
16 - 17.5	8-14-34	Stiff gray sandy SILT. Thin laminated black-gray layering.
18.5 - 20	8-13-15	Gray fine grain SAND. Wet.
21 - 22.5	9-12-17	Same as above.
23.5 - 25	7-14-18	Dark gray fine to coarse grain SAND. Some black staining. Wet.
		E.O.B. @ 25'

CER 051646

E000604

Site Dead Creek Site-N | Boring/Well No. N-1

Sample Depth	Blow Count	Description
1 - 2.5	4-6-10	0-2.5 FILL consisting of crushed limestone, gravel, and fine to coarse grain sand. Wet. Fill discontinues @ 3'.
3.5 - 5	3-9-9	3.5-4 Stiff gray very sandy SILT. Some fine grain sand. Wet. 4-5 Brown silty fine grain SAND. Wet.
6 - 7.5	2-4-3	6-7 Loose gray very sandy SILT. Some fine grain sand. Black and reddish staining throughout. Wet. 7-7.5 Loose brownish gray fine to medium grain SAND. Some reddish staining. Wet.
8.5 - 10	2-4-7	Loose gray sandy SILT. Some fine grain sand. Trace of organic material (wood, etc.). Stained black. Wet.
11 - 12.5	1-2-5	Loose brown very silty fine grain SAND. Some silt. Black stained layer at 12' (-1")
13.5 - 15	1-3-3	Same as above.
16 - 17.5	2-5-7	Firm gray silty fine grain SAND. Trace of small to medium gravel. Wet.
18.5 - 20	2-3-7	Firm gray fine grain SAND. Wet. E.O.B. @ 20'

CER 051647

E000605

Site Dead Creek Site-N Boring/Well No. N-2

Sample Depth	Blow Count	Description
		0-1 Crushed limestone fill
1 - 2.5	9-10-12	1-2 Crushed lime fill 2-2.5 FILL consisting of loose dark gray very sandy SILT. Some fine grain sand. Trace of organic material (wood & roots).
3.5 - 5	N	No recovery - possible rubber tire
6 - 7.5	N	No recovery - possible concrete
8.5 - 10	47-4-2	FILL consisting of dark gray silty clay with concrete material and gravel. Fill discontinues @ approx. 10'.
11 - 12.5	6-10-9	Firm dark gray very sandy SILT. Some very fine grain sand. Trace of organic material (wood and roots). Black streaks. Wet.
13.5 - 15	3-4-4	Firm gray fine to medium grain SAND. Trace of small to medium gravel. Wet. Sand is rounded to sub angular and fairly well to poorly sorted.
16 - 17.5	7-11-12	Gray fine to medium grain SAND. Trace of small gravel. Wet.
18.5 - 20	8-12-14	Dense brown fine to medium grain SAND. Well sorted. Wet.
21 - 22.5	9-13-15	Same as above.
23.5 - 25	9-11-15	Dense gray fine to medium SAND. Trace of coarse grain sand and small gravel. Wet.
26 - 27.5	8-12-13	Dense gray fine to coarse grain SAND. Trace of small gravel. Wet.
28.5 - 30	9-14-23	Same as above.
31 - 32.5	7-9-11	Dense gray very fine grain SAND. Wet.
33.5 - 35	6-8-10	Same as above. Darker gray.
36 - 37.5	12-17-23	Very dense. Gray fine to coarse grain SAND. Wet.
38.5 - 40	8-9-12	Same as above.
		E.O.B. @ 40'

CER 051648

E000606

Site Dead Creek Site-O

Boring/Well No. O-1/Well #EE-21

Sample Depth	Blow Count	Description
		Grassy field on surface
1 - 2.5	4-5-4	Brown silty CLAY. Trace of very fine grain sand. Dry.
3.5 - 5	1-2-2	Same as above.
6 - 7.5	1-1-3	Same as above.
8.5 - 10	3-3-6	Brown fine grain SAND. Trace of silt. Dry.
11 - 12.5	5-5-6	Same as above. Trace of medium grain sand. Moist.
13.5 - 15	1-3-5	Brown medium grain SAND. Trace of coarse grain sand. Wet. Thin gray silty clay layer at 14' (2")
16 - 17.5	1-3-6	Gray fine grain SAND. Wet. Trace of thin gray silty clay layers at 16.5' (1")
18.5 - 20	1-5-5	Gray medium grain SAND. Trace of coarse grain sand and small to large gravel. Wet.
21 - 22.5	7-7-6	Same as above.
23.5 - 25	4-5-7	Same as above.
28.5 - 30	5-3-3	Same as above.
		E.O.B. @ 30'

CER 051649

E000607

Site Dead Creek Site-O Boring/Well No. D-2/Well #EE-22

Sample Depth	Blow Count	Description
		Well vegetated clay cap.
1 - 2.5	2-4-8	FILL consisting of brown silty CLAY. Trace of very fine grain sand.
3.5 - 5	3-5-6	Same as above.
6 - 7.5	2-2-2	Soft black silty CLAY. Black sponge-like substance @ 7.5' (.5')
		Fill discontinues @ approx. 8'.
8.5 - 10	3-5-7	Brown sandy SILT. Trace of fine grain sand. Dry.
11 - 12.5	3-5-7	Brown fine grain SAND. Dry.
13.5 - 15	1-1-1	Soft brown-gray silty CLAY. Trace of very fine grain sand. Moist.
16 - 17.5	3-6-6	Brown very fine grain SAND. Dry.
18.5 - 20	2-3-3	Brown-gray silty CLAY: mottled. Trace of very fine grain sand. Moist.
21 - 22.5	1-1-8	Gray fine grain SAND. Wet.
23.5 - 25	7-19-25	Same as above.
26 - 27.5	6-9-29	Same as above.
28.5 - 30	5-10-11	Same as above.
33.5 - 35	6-8-12	Same as above: oily sheen @ 34'
		E.O.B. @ 35'

CER 051650

E000608

Site Dead Creek Site-O

Boring/Well No. O-1

Sample Depth	Blow Count	Description
		Well vegetated clay cap.
1 - 2	5-5-7	FILL consisting of dense brown silty CLAY. Trace of very fine grain sand.
3.5 - 5	2-1-2	Same as above.
6 - 7.5	1-2-2	Same to 6.5' 6.5-8' Black sponge-like substance. Sludge. Fill discontinues @ approx. 8'.
8.5 - 10	1-6-7	Brown very fine grain SAND. Trace of silt. Dry.
11 - 12.5	3-2-3	Same as above.
13.5 - 15	3-2-3	Brown silty CLAY. Trace of very fine grain sand. Slightly mottled. Moist.
16 - 17.5	3-5-8	Brown silty very fine grain SAND. Dry.
18.5 - 20	7-7-7	Brown very fine grain SAND. Wet @ 20'.
		E.O.B. @ 20'

CER 051651

E000609

Site Dead Creek Site-O

Boring/Well No. O-4

Sample Depth	Blow Count	Description
		Well vegetated clay cap.
1 - 2.5	1-2-2	FILL consisting of dense brown silty CLAY. Trace of fine grain sand.
3.5 - 5	6-3-4	Same as above to 4'. 4-5.5' Black clay-like sludge.
6 - 7.5	1-3-4	Dark greenish-gray very fine grain SAND. Trace of silt. Dry.
8.5 - 10	4-6-8	Dark brown very fine grain SAND. Trace of clay and silt in thin layers.
11 - 12.5	4-4-5	Light brown fine to medium grain SAND. Dry.
13.5 - 15	3-4-5	Brown very fine grain SAND. Trace of silt. Dry.
16 - 17.5	1-3-4	Brown-gray silty CLAY. Trace of very fine grain sand. Dry. Soft black silty clay layer @ 17 1/4' (-2")
18.5 - 20	6-6-7	Gray very fine grain SAND. Trace of silt and medium grain sand. Wet @ 20'.
		E.O.B. @ 20'

Site Dead Creek Site-O

Boring/Well No. D-5

Sample Depth	Blow Count	Description
		Well Vegetated clay cap.
1 - 2.5	1-2-2	FILL consisting of soft brown silty CLAY.
3.5 - 5	1-1-1	Same as above. Fill discontinues @ approx. 5.5'.
6 - 7.5	4-4-4	Brown very fine grain SAND. Some silt. Dry.
8.5 - 10	2-5-7	Brown fine grain SAND.
11 - 12.5	3-4-3	Same as above.
13.5 - 15	2-3-4	Brown-gray silty CLAY. Some interbedding of silty very fine grain sand. Dry.
16 - 17.5	2-2-2	Gray very fine grain SAND. Trace of silt. Moist @ 17'.
18.5 - 20	3-6-8	Same as above. Wet.
		E.O.B. @ 20'

CER 051653

Site Dead Creek Site-O   Boring/Well No. O-6/Well #EE-23

Sample Depth	Blow Count	Description
1 - 2.5	1-2-1	Brown very fine grain SAND. Trace of silt. Dry.
3.5 - 5	1-2-1	Same as above.
6 - 7.5	2-3-2	Same as above. Increased amount of silt.
8.5 - 10	1-2-2	Same as above. Brown-gray silty CLAY layer @ 8.5-9'.
11 - 12.5	1-1-2	Soft gray silty CLAY. Trace of very fine grain sand. Moist.
13.5 - 15	1-1-3	Brown fine to medium grain SAND. Wet.
16 - 17.5	2-6-10	Brown very fine grain SAND. Trace of silt. Wet. Two thin gray silty clay layers (~1") @ 16 3/4'.
18.5 - 20	2-6-10	Brown fine to medium grain SAND. Wet.
21 - 22.5	8-3-14	Brown medium grain SAND. Trace of coarse grain sand and small gravel. Wet.
23.5 - 25	4-7-10	Same as above.
26 - 27.5	4-8-16	Gray fine to medium grain SAND. Trace of small gravel. Wet.
28.5 - 30	4-6-9	Same as above.
33.5 - 35	5-7-11	Same as above.
		E.O.B. @ 35'

CER 051654

E000612

Site Dead Creek Site-O

Boring/Well No. O-7/Well #EE-14

Sample Depth	Blow Count	Description
		Well vegetated clay cap.
1 - 2.5	23-22-22	FILL consisting of black silty CLAY. Some crushed limestone, gravel, fine to coarse grain sand, and silt.
		Fill discontinues @ 3'.
3.5 - 5	6-9-11	Brownish-gray fine grain SAND. Trace of silt. Dry.
6 - 7.5	4-4-4	Gray very fine grain SAND. Some silt. Dry.
8.5 - 10	6-7-7	Brown fine to medium grain SAND. Dry.
11 - 12.5	0-2-8	Brown-silty CLAY. Slightly mottled. Trace of fine grain sand. Moist.
13.5 - 15	6-7-9	Gray very fine grain SAND. Very moist.
16 - 17.5	7-8-10	Brown medium grain SAND. Trace of coarse grain sand and small to medium gravel. Wet.
18.5 - 20	3-2-3	Same as above.
21 - 22.5	3-4-13	Brown very fine grain SAND. Trace of silt. Wet.
23.5 - 25	11-15-25	Brown medium grain SAND. Trace of clay @ 24'. Trace of coarse sand and small gravel. Wet.
26 - 27.5	6-3-5	Same as above.
28.5 - 30	NA	Gray medium grain SAND. Wet.
		E.O.B. @ 33'

CER 051655

E000613

Site Dead Creek Site-O   Boring/Well No. O-8/Well #EE-25

Sample Depth	Blow Count	Description
		Crushed limestone surface. * Straight drill to 23.5 Approximate stratigraphy based on auger cuttings. 0.5'-1.0' Black silty CLAY. Fill. 1.0-20+' Brown fine grain SAND. Trace of silt. Water level while drilling ~19'.
23.5 - 25	11-16-15	Brown fine to medium grain SAND. Wet.
28.5 - 30	9-17-17	Brown-gray fine to medium SAND. Wet.
33.5 - 35	5-8-13	Brown medium grain SAND. Trace of coarse grain sand and small to medium gravel. E.O.B. @ 35'

CER 051656

E000614

Site Dead Creek Site-O | Boring/Well No. O-9

Sample Depth	Blow Count	Description
	Hand auger	0-1 Red-brown silty CLAY (fill-cap material).
1 - 2.5	Hand auger	FILL consisting of red-brown mottled silty CLAY. Trace of fine grain sand and roots. Moist.
3.5 - 5	Hand auger	3.5-4' FILL consisting of grayish-brown silty CLAY. Trace of fine grain SAND. Trace of black hardened material throughout. Fill discontinues @ 4'. 4-5' Brownish-gray very silty fine grain SAND. Some silt. Moist.
6 - 7.5	Hand auger	Loose grayish-brown very silty fine grain SAND. Thin reddish or black-gray staining in horizontal layers.
8.5 - 10	Hand auger	Firm grayish-brown very silty fine grain SAND. Similiar stain as seen in sample above. Very moist. Oily sheen.
11 - 12.5	Hand auger	Grayish-brown sandy silty CLAY. Some silt. Little fine grain sand. Oily sheen in very moist layers.
13.5 - 15	Hand auger	Brown very sandy SILT. Some fine grain sand. 2" fine grain sand layer @ 14.5' stained red-orange. Black-gray stained layers throughout.
16 - 17.5	Hand auger	Brown very silty fine grain SAND. Wet.
18.5 - 20	Hand auger	Same as above. Oily sheen in water. E.O.B. @ 20'

CER 051657

E000615

Site Dead Creek Site-O

Boring/Well No. O-13

Sample Depth	Blow Count	Description
0 - 1	Hand auger	FILL consisting of red-brown sandy silty CLAY
1 - 3.5	Hand auger	FILL consisting of black cinder-like material. Dry.
3.5 - 5	Hand auger	FILL consisting of black cinders. Dry.
5 - 7	Hand auger	FILL consisting of black to greenish-black sludge-like material and soft silty clay. Wet.
		Fill discontinues @ 7'.
7 - 8.5	Hand auger	Greenish-gray fine grain SAND. Black staining throughout. Wet.
8.5 - 10	Hand auger	Greenish-gray very sandy SILT. Black staining. Very moist.
10 - 14	Hand auger	Light brown fine to medium grain SAND. Moist. No apparent staining.
		E.O.B. @ 14'

Site Dead Creek Site-P | Boring/Well No. P-1

Sample Depth	Blow Count	Description
		Crushed limestone on surface.
1 - 2.5	4-3-3	FILL consisting of black sandy CLAY with crushed limestone, slag gravel, coal, and cinders.
3.5 - 5	4-3-3	Same as above.
6 - 7.5	5-7-25/3	FILL consisting of various debris including paper and plastic products, slag gravel, asphalt, and silty clay. Large obstruction encountered @ 7.5'.
8.5 - 10	6-12-10	FILL consisting of brown silty CLAY with various debris including paper products, small gravel, and fine to coarse grain sand. Wet.
11 - 12.5	6-17-3	Same as above.
		FILL discontinues @ 13.5'
13.5 - 15	3-6-7	Dark brown-dark gray silty CLAY. Slightly mottled. Trace of very fine grain sand. Dry.
16 - 17.5	2-4-6	Same as above to 17'. 4" layer of gray fine grain sand @ 17-17 1/3'. Dry. Then dark gray SILT. Trace of very fine grain sand. Dry.
18.5 - 20	3-5-6	Dark gray very fine grain SAND. Trace of silt. 2" gray silty clay layer @ 19'. Then light gray fine to medium grain SAND. Dry.
21 - 22.5	6-10-12	Brown medium grain SAND. Trace of coarse grain sand and small gravel. Dry.
23.5 - 25	6-13-12	Same as above.
28.5 - 30	2-5-7	Same as above.
33.5 - 35	3-5-10	Same as above. Wet.
		E.O.B. @ 35'.

Site Dead Creek Site-P　　Boring/Well No. P-2

Sample Depth	Blow Count	Description
		Crushed limestone on surface.
1 - 2.5	6-6-7	FILL consisting of black-brown sandy CLAY with various debris including paper and plastic products, wood chips, slag, small gravel, fine to coarse grain sands, and brick fragments. Dry.
3.5 - 5	3-3-7	Same as above.
6 - 7.5	3-4-4	Same as above.
8.5 - 10	2-4-6	Same as above.
11 - 12.5	5-5-7	Same as above.
13.5 - 15	7-7-8	Same as above.
16 - 17.5	4-3-14	Same as above. Moist.
18.5 - 20	6-6-8	Same as above.
21 - 22.5	6 - 50/3	Same as above. Spoon refusal.
23.5 - 25	10-6-28	Same as above. Poor recovery.
26 - 27.5	3-5-5	No recovery. Probably same as above.
		FILL apparently discontinues @ 28'.
28.5 - 30	6-9-12	Dark gray fine to medium grain SAND. Moist.
33.5 - 35	7-11-18	Brown medium grain SAND. Wet.
38.5 - 40	7-12-14	Dense brown fine to medium SAND. Wet.
		E.O.B. @ 40'.

Site Dead Creek Site-P Boring/Well No. P-3

Sample Depth	Blow Count	Description
		Black cinder fill on surface.
1 - 2.5	7-9-12	FILL consisting of black and brown sandy clay with various debris material including paper products, wood chips, cloth, tin, rubber, slag, cinders, crushed limestone, an off-white crystalline substance, hay, and fine to coarse grain sand. Dry.
3.5 - 5	3-3-30/6	FILL - same as above.
6 - 7.5	3-3-6	FILL - same as above.
8.5 - 10	6-18-33	FILL - same as above.
11 - 12.5	12-12-13	FILL - poor recovery. Strong moth ball (naphalene) odor.
13.5 - 15	5-7-15	No recovery.
16 - 17.5	6-17-17	FILL - same as above.
		Fill discontinues @ approx. 16.5'.
		Gray silty very fine grain SAND. Dry.
18.5 - 20	5-7-9	Brown fine grain SAND. Dry.
21 - 22.5	4-6-9	Same as above.
23.5 - 25	3-3-5	Same as above. Moist.
26 - 27.5	4-10-8	Same as above. Wet.
28.5 - 30	5-9-11	Same as above. Wet.
		E.O.B. @ 30'

CER 051661

E000619

Site Dead Creek Site-P Boring/Well No. P-4

Sample Depth	Blow Count	Description
		Fill material on surface.
1 - 2.5	3-3-5	FILL consisting of dark brown-black silty clay: some crushed limestone, small gravel, and fine to medium grain sand.
3.5 - 5	4-9-8	FILL - same as above with more debris material including paper products and wood chips.
6 - 7.5	3-4-6	FILL - same as above.
8.5 - 10	5-7-22	FILL - same as above.
11 - 12.5	6-7-7	FILL - poor recovery.
13.5 - 15	2-9-5	No recovery.
16 - 17.5	7-14-19	FILL consisting of brown silty CLAY. Some medium-coarse grain sand and small gravel. Trace of a pale yellow solid (hard and brittle) substance. Dry.
18.5 - 20	2-10-2	FILL - same as above. Trace of paper products and wood chips.
21 - 22.5	13-27-17	FILL - same as above with additional debris including asphalt, slag, crushed limestone, wire, and gravel.
23.5 - 25	4-6-8	FILL - same as above.
		Fill discontinues at approx. 26'.
26 - 27.5	3-4-4	Brown fine grain SAND. Trace of silt. Moist.
28.5 - 30	5-10-10	Same as above. Wet.
31 - 32.5	3-6-10	Brown fine to medium grain SAND. Wet.
33.5 - 35	5-10-13	Same as above. Trace of coarse grain sand. Wet.
		E.O.B. @ 35'

Site Dead Creek Site-P

Boring/Well No. P-5

Sample Depth	Blow Count	Description
		Grass field area on surface.
1 - 2.5	4-5-7	FILL consisting of loose brown-black silty clay with crushed limestone, brick fragments, sand, and small gravel. Dry.
3.5 - 5	4-3-4	FILL - same as above with slag and cinder material.
6 - 7.5	1-2-1	FILL - same as above.
8.5 - 10	1-1-2	FILL consisting of brown-red silty clay. Mottled. Some medium grain sand and small gravel.
11 - 12.5	2-2-2	FILL consisting of brown silty CLAY.
13.5 - 15	1-1-2	FILL - same as above.
16 - 17.5	1-1-1	FILL consisting of brown silty CLAY. Trace of fine grain sand. Moist.
18.5 - 20	1-1-4	FILL - same as above. Trace of small gravel and asphalt.
21 - 22.5	1-2-3	FILL - same as above. Mottled.
		Fill discontinues @ approx. 23'.
23.5 - 25	2-4-7	Light brown fine to medium SAND. Dry.
26 - 27.5	2-4-6	Light brown fine to medium grain SAND. Trace of silt. Dry.
28.5 - 30	2-4-5	Brown fine grain SAND. Wet.
31 - 32.5	6-7-8	Same as above. Trace of coarse grain sand. Wet.
33.5 - 35	7-11-13	Same as above. Trace of coarse grain sand and small gravel. Wet.
		B.O.B. @ 35'

CER 051663

E000621

Site Dead Creek Site-Q

Boring/Well No. Q-1/Well #EE-06

Sample Depth	Blow Count	Description
		Black cinder fill on surface
1 - 2.5	9-20-22	FILL consisting of black-gray silty clay with asphalt, cinders, sand, and gravel. Dry.
3.5 - 5	8-15-12	FILL - same as above.
6 - 7.5	5-9-3	FILL - same as above. Some wood chips.
8.5 - 10	3-6-2	FILL - same as above. With increased amount of debris including traces of rope, paper products, wood chips, and black stained sand.
11 - 12.5	1-3-13	FILL - same as above.
13.5 - 15	4-3-2	FILL - same as above. Fill discontinues @ approx. 14' then dark gray silty CLAY. Moist.
16 - 17.5	3-5-7	Gray silty CLAY. Moist.
18/5 - 20	2-4-4	Gray sandy SILT. Trace of very fine grain sand. Dry.
21 - 22.5	5-5-9	Same as above.
23.5 - 25	1-2-2	Dark gray very fine grain SAND. Some silt. Wet.
26 - 27.5	3-7-11	Light gray fine grain SAND. Trace of silt.
28.5 - 30	5-6-6	Gray SILT. Trace of very fine sand. Wet
31 - 32.5	3-8-11	Same as above. More fine grain sand. Wet.
33.5 - 35	1-3-6	Same as above.
		E.O.B. @ 35'

Site Dead Creek Site-Q

Boring/Well No. Q-2/Well #EE-07

Sample Depth	Blow Count	Description
		Black sandy CLAY with gravel and cinders. Fill on surface.
3.5 - 5	NA	FILL - spoon refusal (possible rubber tire)
8.5 - 10	NA	No recovery.
13.5 - 15	33-10-8	FILL - poor recovery. Appears to be various debris including paper products. Fill discontinues @ approx. 17'.
18.5 - 20	5-8-13	Gray silty CLAY. Trace of very fine grain sand. Dry.
23.5 - 25	3-4-3	Gray silt. Trace of very fine grain sand. Moist.
28.5 - 30	5-10-13	Gray fine grain SAND. Moist.
33.5 - 35	6-6-13	Gray fine to medium grain SAND. Wet.
36 - 37.5	-	Same as above.
		E.O.B. @ 38'

CER 051665

E000623

Site Dead Creek Site-Q

Boring/Well No. Q-3/Well #EE-20

Sample Depth	Blow Count	Description
		Brown-black-gray silty clay FILL on surface.
3.5 - 5	1-1-2	FILL consisting of black SILT. Trace of fine grain sand and black cinders. Thinnly laminated and crumbly.
8.5 - 10	1-0-1	Same as above. Moist at 9'.
13.5 - 15	1-0-0	Same as above. Wet. Fill apparently discontinues @ approx. 17'.
18.5 - 20	2-3-4	Dark gray silty CLAY. Dry.
23.5 - 25	2-3-7	Same as above. Some mottleness. Moist at 25'.
28.5 - 30	2-2-4	Same as above.
33.5 - 35	3-6-13	Gray fine to medium grain SAND. Wet.
38.5 - 40	8-20-30	Same as above.
		E.O.B. @ 40'

Site Dead Creek Site-Q   Boring/Well No. Q-4/Well #EE-09

Sample Depth	Blow Count	Description
		Brown-black silty CLAY FILL on surface. Trace of paper products and sand.
3.5 - 5	6-7-1	No recovery - FILL
8.5 - 10	7-17-12	FILL consisting of brown-black SILTY CLAY with some slag gravel, brick fragments, and broken glass.
13.5 - 15	1-0-1	FILL - same as above. Mostly black cinders, slag gravel, sand, and silt. Fill discontinues @ approx. 16'.
18.5 - 20	9-14-17	Gray to dark gray fine to medium grain SAND. Moist.
23.5 - 25	1-2-5	Same as above. Wet.
28.5 - 30	2-3-12	Same as above.
		E.O.B. @ 33'.

CER 051667

E000625

Site Dead Creek Site-Q

Boring/Well No. Q-5/Well #EE-10

Sample Depth	Blow Count	Description
		FILL materials on surface.
3.5 - 5	3-37-7	FILL consisting of black clayey sand with some black cinders, fly ash, wood chips, and fine to coarse grain sand. Dry.
8.5 - 10	2-4-2	Same as above.
13.5 - 15	NA	No recovery. Possible rubber tire.
18.5 - 20	NA	No recovery - fill apparently discontinues @ 22'.
23.5 - 25	NA	No recovery.
28.5 - 30	4-4-4	Gray fine to medium grain SAND. Wet.
33.5 - 35	22-20-22	Same as above.
		E.O.B. @ 35'

Site Dead Creek Site-Q Boring/Well No. Q-6/Well #EE-17

Sample Depth	Blow Count	Description
		Well vegetated fill on surface.
1 - 2.5	5-6-6	FILL consists of brown silty CLAY. Trace of fine grain sand.
3.5 - 5	3-3-5	FILL consisting of dark brown silty CLAY and brown fine grain sand. Layered. Dry.
6 - 7.5	12-20-22	FILL consisting of brown very fine grain SAND. Some silt. Dry.
8.5 - 10	13-20-40	FILL consisting of brown silty clay and fine grain sand. Trace of coarse grain sand and brick fragments.
11 - 12.5	6-9-5	FILL consisting of brown medium to coarse grain SAND. Trace of small to large gravel and crushed limestone. Dry. Fill discontinues @ 14'.
13.5 - 15	4-4-5	Brown SILT. Trace of very fine grain sand. Dry.
18.5 - 20	4-4-7	Light brown fine grain SAND. Dry.
23.5 - 25	9-18-20	Same as above.
28.5 - 30	10-15-19	Light brown medium grain SAND. Trace of coarse grain sand and small gravel. Wet @ 30'.
33.5 - 35	11-14-20	Same as above.
38.5 - 40	12-14-16	Same as above.
		E.O.B. @ 43'.

CER 051669

E000627

Site Dead Creek Site-Q

Boring/Well No. Q-7/Well #EE-18

Sample Depth	Blow Count	Description
		Black cinder fill on surface.
		Straight drill to 20'.
		Stratigraphy sequence based on auger cuttings.
		0-18' FILL consisting of black clayey SAND with some black cinders, slag material, plastic and paper products, and wood chips.
18.5 - 20	10-17-24	Dark brown - dark gray SILT. Trace of very fine grain sand. Moist. Rust color and oil-like staining. Laminated.
23.5 - 25	4-4-5	Same as above.
28.5 - 30	3-5-8	Brown fine to medium grain SAND. Wet.
33.5 - 35	4-6-10	Same as above.
38.5 - 40	3-5-10	Becomes gray. Same as above. Trace of coarse grain sand.
		E.O.B. @ 43.5'.

Site Dead Creek Site-Q   Boring/Well No. Q-8/Well #EE-19

Sample Depth	Blow Count	Description
		Spent coal coke in piles on surface.
		Straight drill to 30'.
		Stratigraphy sequence based on auger cuttings.
		0-20 FILL consisting of black cinders, slag gravel, and fine to coarse grain sand. Dry. Fill probably discontinues @ approx. 20'.
		20-28.5 Brown-gray SILT. Trace of clay.
28.5 - 30	8-12-15	Gray very fine grain SAND. Trace of silt.
33.5 - 35	8-13-18	Same as above. Trace of coarse grain sand.
38.5 - 40	7-10-14	Same as above.
		E.O.B. @ 43'.

CER 051671

E000629

APPENDIX C

AIR SAMPLING FLOW VOLUME CALCULATIONS
AND CALIBRATION DATA

High Volume Sampler

Calibration Data

CER 051673

E000631

CALIBRATOR ORIFICE for HIGH VOLUME AIR SAMPLER

CERTIFICATE of CALIBRATION

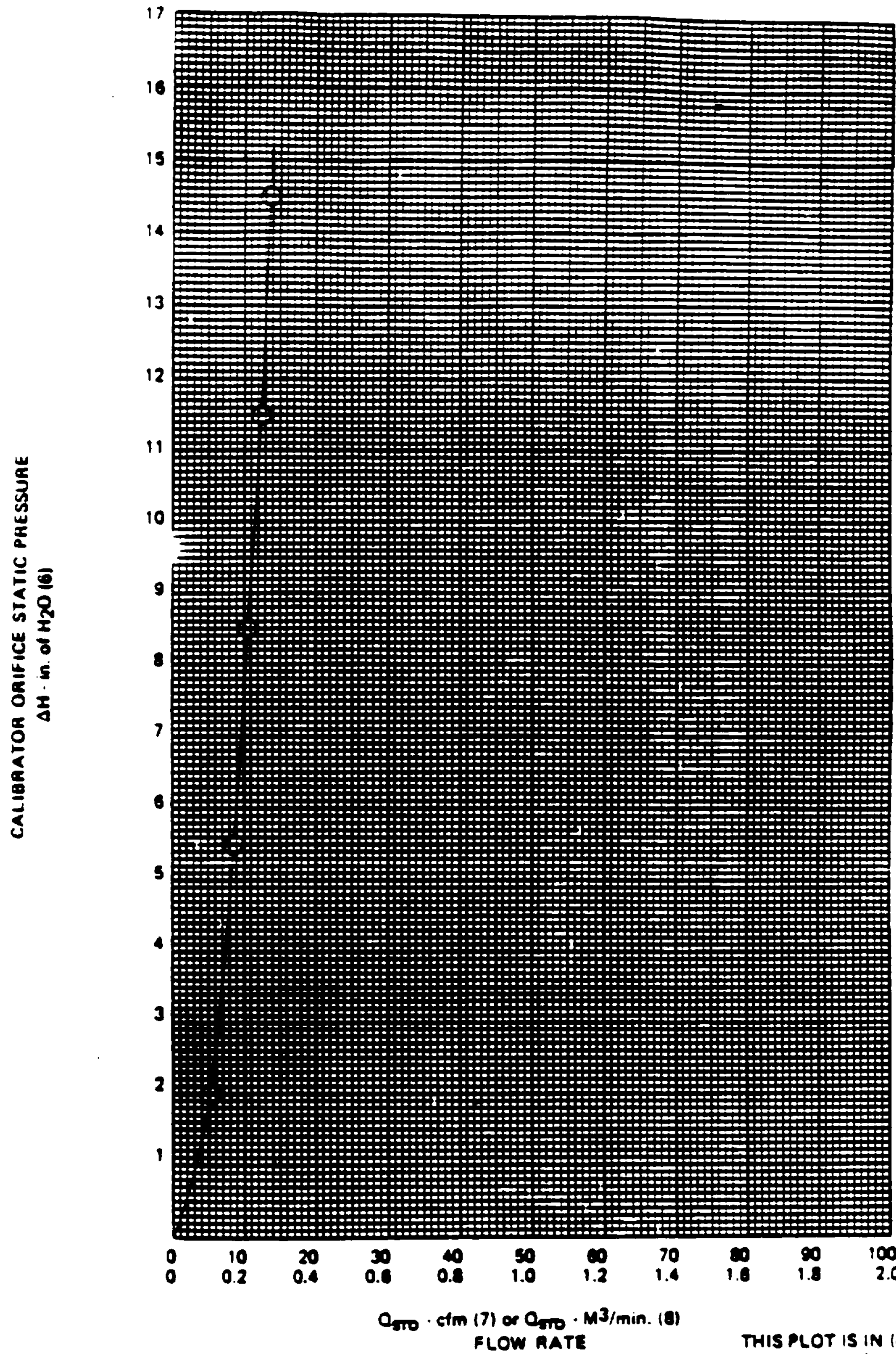
SERIAL NO. 45-C

GENERAL METAL WORKS INC.

8368 BRIDGETOWN ROAD / VILLAGE OF CLEVES, OHIO 45002 / TEL. 513-941-2229

CER 051674

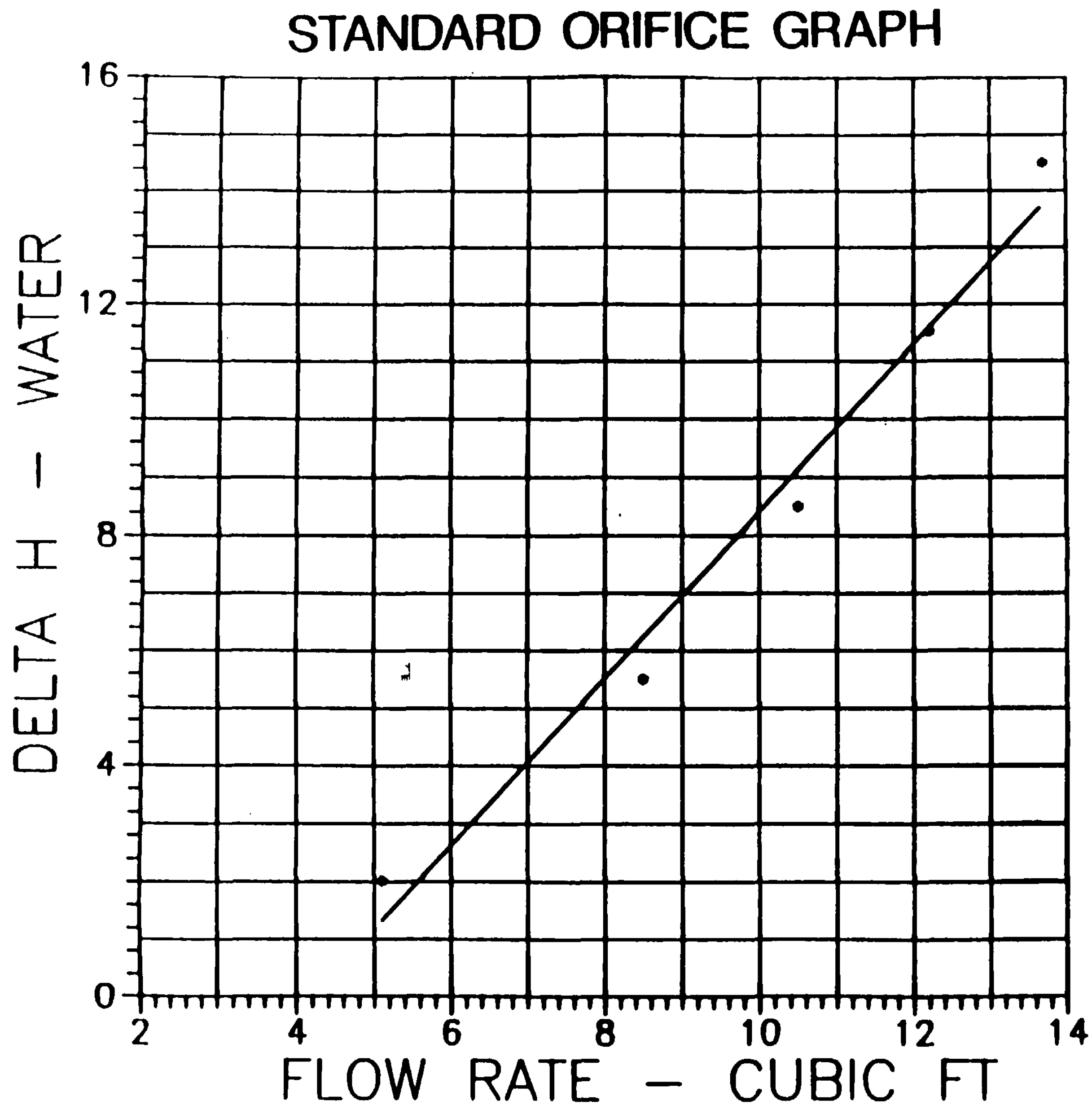
E000632



THIS PLOT IS IN (check one)
cfm ✓
M^3/min. ______
They are NOT EQUIVALENT

CER 051675

E000633



CER 051676

E000634

GMW MODEL PS-1 CALIBRATION FORM

Name: A [illegible] Date: 7/5/87

Site Address: [illegible] CREEK - SITE G

PS-1 Shelter No.: [illegible]-1 Station Pressure: 30.02

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
70	3.7/3.6 ~~3.6/3.6~~		64°F
60	3.2/3.1		
50	2.8/2.7		
40	2.3/2.2		
30	1.7/1.6		

Comments: wind speed - 2 mph

direction 220° (SW)

RH: 73%

CER 051677

E000635

GMW MODEL PS-1 CALIBRATION FORM

Name: A. [illegible] Date: 7/15/87

Site Address: [illegible] CREEK - 3/FAG

PS-1 Shelter No.: FA-3 Station Pressure: 30.02

GMW Model 40 OCU No.: 456

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
70	3.8/3.6		64 °F
60	3.4/3.2		"
50	2.9/2.7		"
40	2.4/2.3		"
30	1.8/1.7		"

Comments: wind speed 8 mph
direction 230° (sw)

CER 051678

E0006[illegible]6

GMW MODEL PS-1 CALIBRATION FORM

Name: A. SAWALL Date: 7/15/87

Site Address: [illegible] CREEK · SITE 6

PS-1 Shelter No.: SS-3 Station Pressure: 30.22

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
70	3.8/3.7		64°F
60	3.4/3.3		"
50	2.9/2.8		"
40	2.4/2.3		"
30	1.8/1.7		"

Comments: WIND SPEED 8 MPH
DIRECTION 220° (SW)

CER 051679

E000637

GMW MODEL PS-1 CALIBRATION FORM

Name: A. [illegible] Date: 7/12/87

Site Address: BEAR CREEK - SITE G

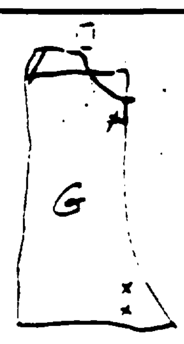
PS-1 Shelter No.: BC-4 Station Pressure: 30.02

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O) HIGH / LOW	OCU Flow-Rate (tcfm)	Temp. (°C)
70"	3.7 / 3.7		64 °F
60	3.3 / 3.3		"
50	2.8 / 2.8		"
40	2.3 / 2.4		"
30	1.8 / 1.8		"

Comments: WIND SPEED 8 MPH

DIRECTION 220° (SW)



CER 051680

E000628

GMW MODEL PS-1 CALIBRATION FORM

Name: [illegible] Date: 7/15/87

Site Address: [illegible]

PS-1 Shelter No.: [illegible] Station Pressure: 30.02

GMW Model 40 OCU No.: 45C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (^oC)
70	3.7/3.6		64°F
60	3.3/3.2		"
50	2.9/2.8		"
40	2.4/2.3		"
30	1.8/1.8		"

Comments: [illegible]
[illegible] 220° (SW)

CER 051681

E0006[illegible]9

GMW MODEL PS-1 CALIBRATION FORM

Name: A [illegible] Date: [illegible]

Site Address: [illegible]

PS-1 Shelter No.: [illegible] Station Pressure: 30.02

GMW Model 40' OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)		OCU Flow-Rate (tcfm)	Temp. (^{o}C)
~~70~~ 68	3.7/3.6	6		64°F
60	3.5/3.4	.4		
50	3.0/2.9	.4		
40	2.4/2.4	56		
30	1.8/1.8	5.4		

Comments: [illegible]

[illegible] 220° (SW)

CER 051682

E0006:0

GMW MODEL PS-1 CALIBRATION FORM

Name: [illegible]

Date: 7/30/87

Site Address: [illegible]

PS-1 Shelter No.: EA-1

Station Pressure: 30.31

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
~~75~~ ~~[illegible]~~ 68	~~[illegible]~~ 35/3.4		87°F
60	32/3.1		
50	27/2.6		
40	2.2/2.1		
30	.1.6/1.6		

Comments:

CER 051683

GMW MODEL PS-1 CALIBRATION FORM

Name: A [illegible] Date: 7/29/27

Site Address: [illegible] CREEK - SITE 2/R

PS-1 Shelter No.: EG-2 Station Pressure: 30.31

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
			89°F
58 ~~60~~	3.2/3.2		
50	2.8/2.8		
40	2.4/2.3		
30	1.8/1.8		

Comments:

CER 051684

GMW MODEL PS-1 CALIBRATION FORM

Name: A Sewall Date: 7/20/87

Site Address: Bear Creek - Site 3/R

PS-1 Shelter No.: EA-2 Station Pressure: 30.21

GMW Model 40 OCU No.: US-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (^{o}C)
62	23/2.3		89°F
60	22/2.2		
50	28/2.7		
40	22/2.2		
30	17/1.7		

Comments:

CER 051685

E000613

GMW MODEL PS-1 CALIBRATION FORM

Name: [illegible] Date: 7/20/92

Site Address: LEAD CREEK - SITE Q/R

PS-1 Shelter No.: GS-4 Station Pressure: 30.31

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
			87°F
58 ~~60~~	3.3/3.1		
50	2.9/2.7		
40	2.4/2.3		
30	1.9/1.8		

Comments:

CER 051686

E0006 4

GMW MODEL PS-1 CALIBRATION FORM

Name: [illegible] Date: 7/20/87

Site Address: Napa Creek - Site O/R

PS-1 Shelter No.: NS-5 Station Pressure: 30.21

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
65	3.6/3.5		59°F
60	3.3/3.2		
50	2.8/2.7		
40	2.4/2.3		
30	1.8/1.8		

Comments:

CER 051687

E0006?5

GMW MODEL PS-1 CALIBRATION FORM

Name: L. Sawall Date: 7/30/87

Site Address: Lear Creek - site 3/R

PS-1 Shelter No.: EE-6 Station Pressure: 30.21

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
64	3.5/3.4		29°F
60	3.4/3.3		
50	2.9/2.8		
40	2.4/2.3		
30	1.3/1.7		

Comments:

CER 051688

GMW MODEL PS-1 CALIBRATION FORM

Name: A Lewell Date: 7/22/87

Site Address: Dead Creek - Sites Q/R

PS-1 Shelter No.: EA-1 Station Pressure: ______

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
*			

Comments: *No AMB calibration for EA-1 due to motor failure.

CER 051689

GMW MODEL PS-1 CALIBRATION FORM

Name: A. SEWALL Date: 7/22/87

Site Address: [illegible] CREEK · [illegible] Q/R

PS-1 Shelter No.: EA-2 Station Pressure: 30.10

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
50	2.9/2.8		86°
40	2.4/2.4		↓
30	1.8/1.8		

Comments: GAUGE READING 50 AT START OF TEST WITH VALVE OPEN.

CER 051690

E0006 :8

GMW MODEL PS-1 CALIBRATION FORM

Name: [illegible] Date: 7/22/87

Site Address: [illegible] CREEK · SITES Q/R

PS-1 Shelter No.: [illegible]-3 Station Pressure: [illegible]

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
62	3.3/3.3		86
60	3.2/3.2		
50	2.8/2.8		
40	2.2/2.2		
30	1.7/1.7		

Comments:

CER 051691

E0006:9

GMW MODEL PS-1 CALIBRATION FORM

Name: A. SAWALL Date: 7/22/87

Site Address: ADAM CREEK - SITES Q/R

PS-1 Shelter No.: EA-4 Station Pressure: 30.10

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
50	2.8/2.8		36°
40	2.3/2.3		↓
30	1.8/1.8		↓

Comments:

CER 051692

E000630

GMW MODEL PS-1 CALIBRATION FORM

Name: A. Seawall Date: 7/22/87

Site Address: Dead Creek - Sites Q/R

PS-1 Shelter No.: EA-5 Station Pressure: 29.0

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (°C)
54	30/31		56°
50	28/27		
40	23/22		
30	17/17		

Comments:

CER 051693

E000651

GMW MODEL PS-1 CALIBRATION FORM

Name: A. SEWALL Date: 7/22/87

Site Address: AAAA CREEK - SITES Q/R

PS-1 Shelter No.: EA-6 Station Pressure: 30.0

GMW Model 40 OCU No.: 45-C

Magnehelic Gauge Reading	Manometer Reading (in. H_2O)	OCU Flow-Rate (tcfm)	Temp. (^oC)
58	3.4/3.1		36°
50	2.9/2.9		
40	2.4/2.4		
30	1.8/1.8		

Comments:

CER 051694

E000652

Bigh Volume Sampler

Air Volume Calculations

CER 051695

E000653

Table for the calculation Air vol. (1) Calculati-y
at standard temperature and pressure 10-21-8

Summary Data

Code	site	shelter no.	Date	Sample Time Elapse Time (min)	Total Air vol. cu.ft standard temp/press.	Air vo Cubic m
DC-01	G	EE-1	7-16-87	733.6	3968	113.05
DC-02	"	EE-2	"	709.4	3598	102.51
DC-03	"	EE-3	"	715.6	3695	105.27
DC-04	"	EE-4	"	739.9	4017	114.44
DC-05	"	EE-5	"	665.6	3582	102.05
DC-06	"	EE-6	"	652	3351	95.47
DC-07		blank				
DC-10	G	EE-1	7-17-87	621.5	3160	90.03
DC-8	"	EE-2	"	719.3	3794	108.09
DC-9	"	EE-3	"	740.2	3531	100.60
DC-13	"	EE-4	"	740.7	4019	114.50
DC-12	"	EE-5	"	733.5	3671	104.59
DC-11	"	EE-6	"	556.6	2899	82.59
DC-20	G/R	EE-1	7-21-87	714.4	4055	115.53
DC-15	"	EE-2	"	566.5	3048	86.84
DC-16	"	EE-3	"	721.9	3668	104.50
~~DC-17~~	"	EE-4	"	566.5	2959	84.30
~~DC-19~~	"	EE-5	"	910.6	ID	—
~~DC-18~~	"	EE-6	"	711.4	4135	117.81
DC-27	G/R	EE-1	7-22-87	ID	—	—
~~DC-22~~	"	EE-2	"	622	3246	92.48
~~DC-23~~	"	EE-3	"	742.2	4135	117.81
~~DC-24~~	"	EE-4	"	621.9	2899	82.59
~~DC-26~~	"	EE-5	"	722.1	3927	111.88
DC-25	"	EE-6	"	735	3898	111.05
DC-28		Blank				

ID: Inaccurate Data

CER 051696

E000654

(1) orifice Transfer standard cal. $Q_{std} = \frac{1}{0.28}\left[\sqrt{\Delta H \cdot \frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} + 0.0156\right]$

Site: ALCO CREEK SITES G/R   Date: 7/21/87   Performed by: D. SAWALL

Sample Site	Sampling Location I.D.	[illegible]	PUF Cart No.	Vortex Reading	Clock Time			Sampler Timer			Venturi Reading				Ambient Temperature °F		Barometric Pressure in Hg		Comments
					Start in CDT	Stop in CDT	Min Elapsed	Start, min	Stop, min	Min Elapsed	START	[illegible]	[illegible]	[illegible]	Start	Stop	Start	Stop	
1	[illegible]	✓			0702	1904	722	1435.8	2150.2	714.4	56	46	46	44	73	87	30.23	30.17	AC-20
2	[illegible]	✓			0633	1920	767	1492	2012.7	566.5	46	40	36	34	73	87	30.23	30.17	AC-15
3	[illegible]	✓			0627	1834	727	1486.7	2208.6	721.9	42	35	33	36	73	87	30.23	30.17	AC-16
4	[illegible]	✓			0632	1918	766	531.5	2008	666.5	46	36	32	38	73	87	30.23	30.17	AC-17 CO-LOCATED
5	[illegible]	✓			0640	[illegible]	729	1420.8	2330.8	910.6	48	40	40	41	73	87	30.23	30.17	AC-19
6	[illegible]	✓			0654	1911	737	1237.6	1949.0	711.4	44	40	34	34	73	87	30.23	30.17	AC-18

WEATHER - HI VOL START: WIND SW (230°) 6 MPH, 75°F, 30.23 (0720)
MIDDLE: WIND SW (200°) 8 MPH, 86°F, 30.26 (1140)
END: WIND SW (210°) 7 MPH, 87°F, 30.17 (1530)

LOW VOL START: WIND SE (160°) 5 MPH, 89°F, 30.25 (0730)
MIDDLE: WIND SW (200°) 8 MPH, 86°F, 30.26 (1140)
END: WIND S (180°) 7 MPH, 88°F, 30.17 (1230)

(a) Record any evidence of tampering with sampler and/or abnormalities in sample operation, PUF cartridge condition or handling, etc.

Data Checked By: ______________________ Date: ______________

FIGURE 4. TYPICAL SAMPLING DATA FORM FOR HIGH VOLUME PESTICIDE/PCB SAMPLER

GENERATOR (rented) ON AC-5 BROKE DOWN 5 MIN AFTER START UP (FLOW CHANGE). REPLACING GENERATOR

[illegible] ON [illegible] PUMP @ AC 4 AT 10:30 AM
[illegible] ON [illegible] PUMP @ AC 3 AT 10:40 AM

steps for the calculation of linear relation between manometer data and flow rate — page 1

$$V_{std} = V_m \times \frac{P_1 - \Delta P}{P_{std}} \times \frac{(T_{STD} \overset{537}{+} 460)}{\underbrace{(T_1 + 460)}_{524}} \quad 1.025$$

$T_{STD} = 77°F$
$T_1 = 64$

$P_{STD} = 29.92$
$P_1 = 29.76$

$\Delta P = 0.2$

$$1 \, m^3/min = 35.3 \, ft^3/min = 35.1 \, cfm$$

$$Q_{std} = \frac{V_{std}}{Time}$$

$$Q_{STD\,1} = \frac{35.3}{6.994} \times \underbrace{\frac{29.76 - 0.2}{29.92} \times 1.025}_{} = 5.11 \, cfm$$

$$Q_{st\,2} = \frac{35.3}{4.178} \times \frac{29.76 - 0.4}{29.92} \times 1.025 = 8.498 \, cfm$$

$$Q_{st\,3^{rd}} = \frac{35.3}{3.356} \times \frac{29.76 - 0.6}{29.92} \times 1.025 = 10.50 \, cfm$$

$$Q_{st\,4} = \frac{35.3}{2.865} \times \frac{29.76 - 0.8}{29.92} \times 1.025 = 12.22 \, cfm$$

$$Q_{st\,5} = \frac{35.3}{2.538} \times \frac{29.76 - 1}{29.92} \times 1.025 = 13.70 \, cfm$$

CER 051698

E000656

Date of :7-22-8?

EE-1 site Q/R [Table of calibration of flow rate (Q) versus M_{std}] calculated by

magnehelic gauge reading (M)	M_{std} (X) [(1)]	manometer (ΔH) reading (in. H_2O)	$\sqrt{\text{corrected } \Delta H}$ [(1)] $= \sqrt{\Delta H \cdot \frac{P_2}{P_{std}} \cdot \frac{T_{std}}{T}}$	Q (cfm) (Y) [(2)]
68	8.246	3.5/3.4	1.846	6.648
60	7.70	3.2/3.1	1.764	6.356
50	7.03	2.7/2.6	1.618	5.834
40	6.286	2.2/2.1	1.457	5.25?
30	5.44	1.6/1.6	1.28	4.63

(1)
$$T = 460 + 89 = 549, \quad T_{std} = 537$$
$$P = 30.21 \text{ in}$$
$$P_{std} = 29.92$$
$$\sqrt{\frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} = \sqrt{\frac{30.21}{29.92} \cdot \frac{537}{549}} = .994$$
$$\sqrt{\text{corrected } \Delta H} = \sqrt{\Delta H} \cdot .994 \quad / \quad M_{std} = \sqrt{M} \cdot 0.994$$

(2)
$$Q = \frac{1}{0.28}\left[\sqrt{\Delta H \cdot \frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} + .0156\right]$$

Q, M_{std}

$$Y = mX + b$$
$$Y = 0.733X + 0.658$$
$$cc = 0.998$$

CER 051699

E000657

Date of Calibration 7-22-87 [Tabulate values of ... versus M_{std}]

EE-3 at O/R

magnehelic Gage Reading (M)	$M_{std}^{(1)}$ (X)	manometer (ΔH) Reading (in. H_2O)	$\sqrt{\text{corrected } \Delta H}^{(1)} = \sqrt{\Delta H \cdot \frac{P_2}{P_{std}} \cdot \frac{T_{std}}{T}}$	$\Theta^{(2)}$ (cfm) (Y)
63	7.89	3.3/3.3	1.806	6.506
60	7.70	3.2/3.2	1.778	6.406
50	7.03	2.8/2.7	1.648	5.941
40	6.29	2.2/2.2	1.474	5.32
30	5.44	1.7/1.7	1.296	4.684

(1)
$T = 460 + 89 = 549, \quad T_{std} = 537$

$P = 30.21$ in

$P_{std} = 29.92$

$\sqrt{\frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} = \sqrt{\frac{30.21}{29.92} \cdot \frac{537}{549}} = .994$

$\sqrt{\text{corrected } \Delta H} = \sqrt{\Delta H} \cdot .994 \;//\; M_{std} = \sqrt{M} \cdot .994$

(2) $\Theta = \frac{1}{0.28}\left[\sqrt{\Delta H \cdot \frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} + .0156\right]$

Q, magnehelic Reading

$Y = mX + b$

$Y = 0.754\,X + 0.589$

cc = .999

CER 051700

E000658

Date of Cal. 7-22-57 [versus M_{std}

EE-5 at Q/R

magnehelic Gage Reading	$M^{(1)}_{std}$ (X)	manometer (ΔH) Reading (in. H_2O)	$\sqrt{\text{corrected } \Delta H}$ (1) $= \sqrt{\Delta H \cdot \frac{P_2}{P_{std}} \cdot \frac{T}{T}}$	$Q^{(2)}$ (cfm) (Y)
68	8.196	3.6/3.5	1.873	6.745
60	7.70	3.3/3.2	1.778	6.406
50	7.03	2.8/2.7	1.648	5.941
40	6.286	2.4/2.3	1.5241	5.498
30	5.44	1.8/1.8	1.333	4.816

(1)
$T = 460 + 89 = 549$, $T_{std} = 537$

$P = 30.21$ in

$P_{std} = 29.92$

$$\sqrt{\frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} = \sqrt{\frac{30.21}{29.92} \cdot \frac{537}{549}} = .9941$$

$\sqrt{\text{corrected } \Delta H} = \sqrt{\Delta H} \cdot .994$ // $M_{std} = \sqrt{M} \cdot 0.994$

(2) $Q = \frac{1}{0.28}\left[\sqrt{\Delta H \cdot \frac{P}{P_{std}} \cdot \frac{T_{std}}{T}} + .0156\right]$

Q, magnehelic Reading

$Y = mX + b$

$Y = 0.689\,X + 1.10$

$cr = 0.999$

CER 051701

E000659

EE-1 7/16/57
Site G

Time (min)	Elapse Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M Std (1)	Avg. M Std. (X)	Avg. Q (2)	Air volume (3)
7 0 2			42	6.56			
	448	443			6.50	5.42	2401
14:30			41	6.43			
	135	134			6.47	5.40	723
16:45			42	6.51			
	158	156			6.48	5.41	844
19:23			4.2	6.46			

Total Air vol. 3968 c.f.

(1) $M_{std} = \overline{M} \times$ Correction factor $\quad CF_1 = \sqrt{\frac{30.05 \times 537}{29.92 \times 537}} = 1.012 \quad CF_{Avg} = 1.004$

Correction factor $= \frac{P \times T_{std}}{P_{std} \times T}$ $\quad CF_2 = \sqrt{\frac{30.03 \times 537}{29.92 \times 542}} = .997$

(2) $\overset{Q}{Y} = 0.733X + 0.658$

(3) Air volume = Q × Elapse Time

CER 051702

E000660

E-3 7/16/87
Site C

Time (min)	Elapse Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{Std} (1)	Avg. M_{Std} (X)	Avg. Q (2)	Air Volume (3)
7:10			38	6.24			
	440	410.6			6.09	5.17	2[illegible]3
4:30			35	5.94			
	135	126			5.98	5.10	642
6:45			36	6.02			
	195	182			6.00	5.11	930
0:00			36	5.98			

Total Air 3695

(1) $M_{std} = \sqrt{M} \times$ Correction factor
Correction factor $= \sqrt{\frac{P}{P_{std}} \times \frac{T_{std}}{T}}$

$CF_1 = 1.012$ $CF_{Avg} = 1.004$
$CF_2 = .997$

2) $\overset{Q}{Y} = 0.754X + 0.589$

3) Air volume = Q × Elapse Time

CER 051703

E000651

FE-5 7/16/87
Site C.

Time (min)	Elapse Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{Std} (1)	Avg. M_{Std} (X)	Avg. Q (2)	Air volume (3)
7.22			40	6.40			
	428	373			6.26	5.41	2018
4.30			37	6.11			
	135	117			6.06	5.27	617
6.45			36	6.02			
	205	178			6.12	5.32	947
20/0			39	6.23			

Total Air vol. 3582 ft^3

(1) $M_{Std} = \sqrt{M} \times$ Correction factor
Correction factor $= \sqrt{\frac{P}{P_{Std}} \times \frac{T_{Std}}{T}}$

$CF_1 = 1.012$
$CF_2 = .997$
$CF_{Avg} = 1.004$

(2) $Y = 0.689X + 1.10$ (Y = Q)

(3) Air volume = Q × Elapse Time

CER 051704

E000662

E-1 7-17-87

Time (min)	Elapsed Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)
5:00			5.3	7.36			
	300	246			6.56	5.47	34[illegible]
[illegible]00			3.3	5.76			
	210	17.2			5.71	4.84	832
[illegible]:30			3.2	5.67			
	247	20.3			5.7	4.84	982
8:37			3.3	5.73			

Total Air vol. 3160

(1)
M_{std} = [illegible] + Correction factor

$$CF_1 = \sqrt{\frac{30.14 + 537}{29.92 + 529}} = 1.011 \qquad CF_{Avg} = 1.003$$

$$CF_2 = \sqrt{\frac{30.10 + 537}{29.92 + 545}} = .997$$

2) $\overset{Q}{Y} = 0.733X + 0.658$

) Air volume = Q × Elapsed Time

CER 051705

E000663

[illegible]-3   7-17-87
Site C

Time (min)	Elapsed Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg M_{std} (X)	Avg Q (2)	Air volume (3)
[illegible]08			38	6.23			
	292	290			5.86	5.01	453
1.00			30	5.49			
	210	209			5.40	4.66	[illegible]
4:30			28	5.31			
	242	241			5.29	4.58	[illegible]104
8:32			28	5.27			

Total Air vol. 3531

(1)
$M_{std} = \sqrt{M} \cdot$ Correction factor $cf_1 = 1.011$
Correction factor = $\sqrt{\frac{P}{P_{std}} \cdot \frac{T_{std}}{T}}$ $cf_2 = .997$
$cf_{Avg} = 1.003$

(2) $Y = 0.754X + 0.589$

(3) Air volume = $Q \times$ Elapsed Time

CER 051706

E000684

EE-5

S. É Ca 7-17-87

Time (min)	Elapse Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)
5 53			44	6.71			
	307	301			5 36	4.79	[illegible]
1.00			36	6.02			
	210	206			5.93	5.18	[illegible]
4:30			34	5.85			
	230	226			5.87	5.14	[illegible] 162
8:20			35	5.90			

Total Air vol. 3671

(1)
$M_{std} = \sqrt{M} \times$ Correction factor

Correction factor $= \sqrt{\frac{P}{P_{std}} \cdot \frac{T_{std}}{T}}$

$cf_1 = 1.011$
$cf_2 = .997$
$cf_{Avg} = 1.003$

(2) $Y = 0.689X + 1.10$

(3) Air volume = Q × Elapse Time

CER 051707

E000665

FE-1

Site G/R 7-21-57

[illegible]	Elapsed Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{Std} (1)	Avg. M_{Std} (X)	Avg. Q (2) Y	Air volume (3)
02			56	7.55			
	198	196			7.17	5.9	[illegible]
20			46	6.79			
	250	247			6.79	5.63	[illegible]
30			46	6.79			
	274	271			6.69	5.56	1507
04			44	6.60			
							4055

Total Air volume = 4055 Cft

$M_{Std} = \sqrt{M} \times$ Correction factor (CF)

Correction factor $= \sqrt{\frac{P}{P_{Std}} \times \frac{T_{Std}}{T}}$

$CF_{start} = \sqrt{\frac{30.23}{29.92} \times \frac{537}{533}} = 1.009$

$CF_{stop} = \sqrt{\frac{30.17}{29.92} \times \frac{537}{547}} = 0.995$

$CF_{avg} = \frac{CF_1 + CF_2}{2} = 1.002$

$\overset{Q}{Y} = 0.733 X + 0.658$

Air volume = Q × Corrected Time

CER 051708

E0006?6

-FE-03

Site Q/R 7-21-87

Time (min)	Elapsed Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)
6 27			42	6.54			
	233	231			6.23	5.286	22
0.20			35	5.93			
	250	248			5.84	4.99	1237
4.30			33	5.75			
	244	242			5.86	5	1210
8.34			36	5.97			

Total Air Volume = 3668 Cu. ft. 3668

(1) $M_{std} = \sqrt{M} \times$ Correction factor $Cf_1 = 1.009$ $Cf_{avg} = 1.002$
$Cf_2 = 0.995$

Correction factor = $\sqrt{\frac{P}{P_{std}} \times \frac{T_{std}}{T}}$

(2) $\overset{Q}{Y} = 0.754X + 0.589$

(3) Air volume = Q × Corrected Time

CER 051709

FC00657

Data is not accurate

FE-5

9/R 7-21-87

Time (min)	Elapse Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)
40			46	6.84			
	220				6.59	5.64	
20			40	6.34			
	250				6.34	5.468	
4.30			40	6.34			
	259				6.35	5.475	
49			41	6.37			

(1)

$M_{std} = \sqrt{M} \times$ Correction factor

Correction factor $= \sqrt{\frac{P}{P_{std}} \times \frac{T_{std}}{T}}$

(2) Q

$Y = 0.689X + 1.10$

Air volume = Q × Time

CER 051710

E000668

FE-1
Site G/R 7/22/87 Motor Break Down

Time (min)	Elapsed Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)

1) $M_{std} = \sqrt{M} \times$ Correction factor

Correction factor $= \sqrt{\frac{P}{P_{std}} \times \frac{T_{std}}{T}}$

Q
)

Air volume = Q × Time

CEA 051711

E000669

FE-3 7-22-87
Site G/R

Time (min)	Elapse Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)
6 35			54	7.40			
	325	325			6.94	5.82	[illegible]
2 00			42	6.49			
	180	180			6.41	5.42	976
5 00			40	6.34			
	237	237			6.32	5.35	1268
3.57			40	6.30			
					Total Air		4135 cf

(1) $M_{std} = \sqrt{M} \times$ Correction factor $cf_1 = 1.007$ $cf_{Avg} = 1.002$

Correction factor $= \sqrt{\frac{P}{P_{std}} \times \frac{T_{std}}{T}}$ $cf_2 = 0.997$

(2) $Y = 0.754X + 0.589$

(3) Air volume = Q × Elapsed Time

CER 051712

E000670

EE-05 7-22-87
Site G/R

Time (min)	Elapsed Time (min)	Corrected Time (min)	Magnehelic Reading (M)	M_{std} (1)	Avg. M_{std} (X)	Avg. Q (2)	Air volume (3)
6:14			47	6.90			
	346	341			6.54	5.6[illegible]	[illegible]
12:00			38	6.18			
	180	177			6.13	5.32	[illegible]
15:00			37	6.09			
	206	203			6.07	5.28	1072
18:26			37	6.06			

Total air volume 392[illegible]

(1)
$M_{std} = \sqrt{M} \times$ Correction factor

Correction factor $= \sqrt{\frac{P}{P_{std}} \times \frac{T_{std}}{T}}$

(2) $Y = 0.689X + 1.10$

3) Air volume = Q × Elapsed Time

CER 051713

E000671

Low Volume Sampler
Air Volume Calculations and
Calibration Data

CER 051714

E000672

Calibration Factors for Calculation [illegible] of flow volume at Standard Temperature and pressure

[illegible] NO	Date	Correction Factor for Standard Temp & press. (1) Start of Test	Final Test	Avg value
EE1	7/16/87	1.02	0.994	1.007
"	7/17/87	1.02	0.991	1.006
"	7/21/87	1.018	1.0	1.009
"	7/22/87	1.015	0.995	1.005
EE2	7/16/87	1.02	0.994	1.007
"	7/17/87	1.02	0.991	1.006
"	7/21/87	1.018	1.0	1.009
"	7/22/87	1.015	0.995	1.005
EE3	7/16/87	1.02	0.994	1.007
"	7/17/87	1.02	0.991	1.006
"	7/21/87	1.018	1.0	1.009
"	7/22/87	1.015	0.995	1.005
EE4	7/16/87	1.02	0.994	1.007
"	7/17/87	1.02	0.991	1.006
"	7/21/87	1.018	1.0	1.009
"	7/22/87	1.015	0.995	1.005
EE5	7/16/87	1.02	0.994	1.007
"	7/17/87	1.02	0.991	1.006
"	7/21/87	1.018	1.0	1.009
"	7/22/87	1.015	0.995	1.005
EE6	7/16/87	1.02	0.994	1.007
"	7/17/87	1.02	0.991	1.006
"	7/21/87	1.018	1	1.009
"	7/22/87	1.015	0.995	1.005

CER 051715

square root of these coefficients were used in the calculation of air volume of samples collected by high volume sampler

E000673

[illegible] Air volume calculations of samples collected by low volume samplers

[illegible] 2-23-88

Sample No		Station No.	Elapsed Time (min)	Average flow rate (ml/min)	Total air volume (m³)	[illegible] Standard vol.
OC-CT-02	(7/14/87)	EE2	480	464.9	0.223	0.225
OC-PT-02			480	1059	0.508	0.512
OC-CT-03		EE3	478	562.85	0.269	0.271
OC-PT-03			478	1090.65	0.521	0.525
C-CT-01		EE1	482	499	0.241	0.243
C-PT-01		"	482	789.5	0.38	0.383
-CT-06		EE6	478	352.75	0.169	0.170
-PT-06		"	478	1065	0.509	0.513
C-CT-05		EE5	477	468.9	0.224	0.226
-PT-05		EE5	477	1019.15	0.486	0.489
-CT-08	7/17/87	EE2	491	512.1	0.251	0.252
-PT-08		"	491	991.95	0.487	0.490
-CT-09		EE3	486	559.5	0.272	0.274
-PT-09		EE3	486	717.6	0.349	0.351
-CT-010		EE1	481	500.55	0.241	0.242
-PT-10		EE1	481	622.35	0.299	.301
-CT-11		EE6	478	393.7	0.188	0.189
-PT-11		EE6	478	1100	0.526	0.529
-CT-12		EE5	476	505.6	0.241	0.242
-PT-12		EE5	476	988.85	0.471	0.474

1)

$$V_{std} = \underbrace{\frac{T_s}{P_s} \cdot \frac{P}{T}}_{} \cdot V$$

Correction factor for standard Temp & pres. (See attached table for this [illegible])

CER 051716

E000674

[illegible]	[illegible]	[illegible]	[illegible]	Sample location	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AC-CF-08	7/13/87	0820	1631	[illegible]	CF	506.1 ml	318.1 ml	[illegible]	
AC-PF-08		0820			PF	1011 ml	466.9 ml		
AC-PC-08		0610			PC	44		[illegible]	
AC-FF-08		0610			FF	44		[illegible]	
AC-CF-09		0830	1636	[illegible]	CF	545.8 ml	513.2 ml	[illegible]	
AC-PF-09		0830	1636		PF	1068 ml	361.2 ml		
AC-PC-09		0608			PC	38		[illegible] 3	
AC-FF-09		0608			FF	38		[illegible] 3	
AC-CF-10		0842	1643	Site 6 - NE corner	CF	545.1 ml	456.0 ml	[illegible]	
AC-PF-10		0842	1643		PF	889.5 ml	355.2 ml	"	
AC-PC-10		0600			PC	53		[illegible] 1	
AC-FF-10		0600			FF	53		[illegible] 1	
AC-CF-11*		0847	1645	Site 6 - NE corner	CF	[illegible] ml	305.4 ml	[illegible]	[illegible] (44 1)
AC-PF-11*		0847	1645		PF	1055 ml	[illegible]45 ml	"	
AC-PC-11*		0602			PC	40		[illegible] 6	
AC-FF-11*		0602			FF	40		[illegible] 6	
AC-CF-12		0700	1656	[illegible] site 6, [illegible]	CF	547.5 ml	463.1	[illegible]	
AC-PF-12		0700	1656		PF	1041 ml	336.7	"	
AC-PC-12		0553			PC	44		[illegible] 3	
AC-FF-12		0553			FF	44		[illegible] 3	
AC-PC-13		0557		Site 6 NW corner	PC	47		[illegible] 4	
AC-FF-13		0547			FF	47		[illegible] 4	
AC-CF-14*				Blank	CF	-			
AC-PF-14*				Blank	PF	-			
AC-PC-14*				Blank	PC	-			
AC-FF-14*				Blank	FF	-			

SAMPLE No.	DATE	START TIME	END TIME	SAMPLE LOCATION	[illegible]	FLOW START	FLOW END	[illegible]	NOTES
AC-CT-23	7/02/81	0825	1645	NW PORTION OF MONSANTO FENCE	CT	1540.8 ml	530.6 ml	[illegible]	
AC-PT-23		0825	1645	" " "	PT	1970.2 ml	915.3 ml		
AC-PC-22		0608	1914	NW PORTION OF MONSANTO FENCE	PC	38	36	CC 2	
AC-PF-22		0608	1914	" " "	FF	38	36	CC 2	
AC-CT-23		0900	1702	NE CORNER - OF PUMP STATION	CT	161.8 ml	611.2 ml	[illegible]	
AC-PT-23		0900	1702	" " "	PT	200 ml	168 ml	"	
AC-PC-23		0635	1857	NE CORNER - OF PUMP STATION	PC	31	40	CC 3	
AC-PF-23		0635	1857	" " "	FF	31	40	CC 3	
AC-CT-24		0840	1642	NW PORTION OF MONSANTO FENCE	CT	446.8 ml	533 ml	[illegible]	[illegible]
AC-PT-24		0840	1642	" " "	PT	330.0 ml	403 ml	"	
AC-PC-24		0607	1913	NW PORTION - OF MONSANTO FENCE	PC	32 ~~[illegible]~~	28	CC 4	
AC-PF-24		0607	1913	" " "	FF	32	28	CC 4	
AC-CT-25		0850	1654	SW PORTION - BACKGROUND	CT	515 ml	521.0 ml	[illegible]	
AC-PT-25		0850	1654	" " "	PT	[illegible] ml	984.2 ml	"	
AC-PC-25		0621	1841	SW PORTION - BACKGROUND	PC	46	35	CC 6	
AC-PF-25		0621	1841	" " "	FF	46	35	CC 6	
AC-CT-26		0845	1648	SW - NORTHERN PORTION SITE Q	CT	517.0 ml	516.9 ml	[illegible]	
AC-PT-26		0845	1648	" " "	PT	966.5 ml	840.1 ml	"	
AC-PC-26		0614	1826	SW NORTHERN PORTION SITE Q	PC	47	37	CC 5	
AC-PF-26		0614	1826	" " "	FF	47	37	CC 5	
AC-PC-27		0627	—	SE PORTION SITE Q	PC	58	—	CC 1	[illegible]
AC-PF-27		0627	—	" " "	FF	58	—	CC 1	
AC-CT-28		0800	—	BLANK	CT	—		—	
AC-PT-28		0800	—	BLANK	PT	—			
AC-PC-28		0800	—	BLANK	PC	—			
AC-PF-28		0800	—	BLANK	FF	—			

CER 051718

E000676

APPENDIX D

ANALYTICAL RESULTS

Explanation For Analytical Data Summary Tables

All ground water results in ug/l.
All soil sediment organic results in ug/kg
All soil/ sediment inorganic results in mg/kg

For sample location headings, the following qualifiers are used

- \+ Denotes blank samples.
- * Denotes duplicate samples.
- ^ Denotes that sample was not analyzed for the compounds listed.

For chemical results, the folling qualifiers are used :

- B Compound detected in blank samples.
- J Estimated value . Result is less than the specified detection limit, but greater than zero.
- E Estimated value. Concentration detected exceeds the calibrated range.
- C Result confirmed by GC/MS.
- * Duplicate analysis not with in control limits.
- R Spike sample recovery not with in control limits.

CER 051720

E000678

Ground Water Volatiles

SITE	SITE 6	BLANK	SITE 1	SITE 6	SITE 6	SITE 6	BLANK	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	BLANK
SAMPLE NUMBER	DC GW-16	DC GW 17 *	DC GW-18	DC GW 19	DC GW 20 *	DC GW 21	DC GW-22 *	DC GW 23	DC GW 24	DC GW 25	DC GW 26	DC GW 27	DC GW 28	DC GW 29 *	DC GW [illegible]
WELL NUMBER	EE 6104		EE 6100	EE 6147	EE 6107	EE 05		EE 13	EE 12	EE 6112	EE 14	EE 15	EE 1[illegible]	EE 1[illegible]	
DATE SAMPLED	3-17-87	3-17-87	3-10-87	3-10-87	3-10-87	3-10-87	3-10-87	3-25-87	3-25-87	3-25-87	3-25-87	3-25-87	[illegible]	3-25-87	[illegible]
1 Chloromethane															
2 Bromomethane															
3 Vinyl Chloride										5 J		76	190	6 J	
4 Chloroethane															
5 Methylene Chloride	5 B	1 BJ		110 BJ	250 B		2 BJ				56 J	2 J			
6 Acetone	8 BJ	10 B		620 B	330 B		4 BJ	29 B	40 B	17 B	100 J	10 B	190 B	16 B	
7 Carbon Disulfide															
8 1,1-Dichloroethene												10			
9 1,1-Dichloroethane												120			
10 trans-1,2-Dichloroethene				100 J	200 J						150	510	64		
11 Chloroform	5 J	1 J					1 J				110 J				
12 1-2-Dichloroethane				400	430										
13 2-Butanone (MEK)															
14 1,1,1-Trichloroethane															
15 Carbon Tetrachloride															
16 Vinyl Acetate															
17 Bromodichloromethane															
18 1,2-Dichloropropane															
19 trans-1,3-Dichloropropene															
20 Trichloroethene				320	340						270	4 J			
21 Dibromochloromethane															
22 1,1,2-Trichloroethane															
23 Benzene	1 J		1 J	4100	3700	2 J	3 J		50	20	1400	[illegible]	[illegible]	[illegible]	
24 cis-1,3-Dichloropropene															
25 2-Chloroethyl Vinyl Ether															
26 Bromoform															
27 4-Methyl-2-pentanone				1900	2200						250 J				
28 2-Hexanone							4 J								
29 Tetrachloroethene				420	350	14					470				
30 1,1,2,2-Tetrachloroethane															
31 Toluene	3 J			7500	6300	2 J	4 J				740		740	1 J	
32 Chlorobenzene	5	1 J	1 J	3100	3100	1 J	2 J		270	33	3100	120	[illegible]	390	
33 Ethylbenzene				63 J						1 J	190		[illegible]	2 J	
34 Styrene				50 J											
35 Total Xylenes				280	240 J						61 J		[illegible]		

CER 051721

E000679

Ground Water Volatiles

SITE	SITE B	SITE B	SITE B	SITE A	SITE B	SITE B	SITE B	SITE B	SITE B	SITE A	BLANK	PRIVATE	PRIVATE	PRIVATE	PRIVATE	PRIVATE
SAMPLE NUMBER	BC-GW-42 B	BC-GW-43	BC-GW-43A	BC-GW-44	BC-GW-45	BC-GW-46	BC-GW-47	BC-GW-48B	BC-GW-49	BC-GW-50	BC-GW-51*	BC-GW-52	BC-GW-[illegible]	BC-GW-[illegible]	BC-GW-55	BC-GW-[illegible]
WELL NUMBER	EE-24	EE-25	EE-25	P-1	B-20A	P-7	B-26A	B-26A	B-25A	P-11		WRIGHT	JETTIES	SCHMIDT	McDONALD	[illegible]
DATE SAMPLED	3-24-87	3-24-87	7-10-87	3-25-87	3-25-87	3-25-87	3-25-87	3-25-87	3-25-87	3-25-87	3-25-87	3-26-87	[illegible]-26-87	[illegible]-26-87	3-26-87	[illegible]
1 Chloromethane																
2 Bromomethane																
3 Vinyl Chloride																[illegible]
4 Chloroethane																[illegible]
5 Methylene Chloride	310										2 J	4 BJ	12 B		27 B	
6 Acetone	630	58			71 B	1700 B	3 BJ	36 BJ	1600 B	[illegible] BJ	3 BJ	10 B	10 B	6 BJ	9 BJ	
7 Carbon Disulfide													3 J			
8 1,1-Dichloroethene							7									
9 1,1-Dichloroethane							3 J									
10 trans-1,2-Dichloroethene	94 J															
11 Chloroform											1 J		1 J			
12 1,2-Dichloroethane									16099							
13 2-Butanone (MEK)	370		5 BJ													
14 1,1,1-Trichloroethane	43 J															
15 Carbon Tetrachloride																
16 Vinyl Acetate																
17 Bromodichloromethane																
18 1,2-Dichloropropane																
19 trans-1,3-Dichloropropene																
20 Trichloroethene	1000															
21 Dibromochloromethane																
22 1,1,2-Trichloroethane																
23 Benzene	1000			2 J		1500	41	44 J		150						[illegible]
24 cis-1,3-Dichloropropene																
25 2-Chloroethyl Vinyl Ether																
26 Bromoform																
27 4-Methyl-2-pentanone																
28 2-Hexanone																
29 Tetrachloroethene																
30 1,1,2,2-Tetrachloroethane																
31 Toluene	130					400	7 B	13 BJ	760 J			1 BJ	1 BJ		1 BJ	
32 Chlorobenzene	1000			350 E	990	5000	190	199	8100	570	1 J					[illegible]
33 Ethylbenzene							2 J					4 J				[illegible]
34 Styrene													2 J		2 J	
35 Total Xylenes	27 J					95 J	7									

Ground Water Semivolatiles

SITE	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE H	SITE H	SITE H	SITE H	SITE G
SAMPLE NUMBER	DC-GW-01	DC-GW-02	DC-GW-03	DC-GW-04	DC-GW-05	DC-GW-06	DC-GW-07	DC-GW-08 [illegible]	DC-GW-09	DC-GW-10	DC-GW-11	DC-GW-12	DC-GW-13	DC-GW-14
WELL NUMBER	EE-06	EE-07	EE-09	EE-14	EE-17	EE-08	EE-19	EE-19	EE-10	EE-01	EE-02	EE-[illegible]	EE-[illegible]	EE-[illegible]
DATE SAMPLED	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-17-87	3-17-87	3-17-87	3-17-87	3-17-87
1 Phenol							110000 E	190000 E	6100 E	66	950			
2 bis(2-Chloroethyl)ether														
3 2-Chlorophenol				4 J			20000 E	33000 E	2600	31 J	47 J			
4 1,3-Dichlorobenzene										120				
5 1,4-Dichlorobenzene				4			220 J	250	76 J	2600	[illegible]	11		
6 Benzyl Alcohol							660	490	10[illegible]		760			
7 1,2-Dichlorobenzene							260	300	2000	560	830	[illegible]		
8 2-Methylphenol							190 J	350	10 J	26 J	79 J			
9 bis(2-Chloroisopropyl) ether		3 J												
10 4-Methylphenol							14000 E	23000 E	850	65	620			
11 N-Nitroso-n-Dipropylamine														
12 Hexachloroethane														
13 Nitrobenzene								100 J	820		97 J			
14 Isophorone											110 J			
15 2-Nitrophenol														
16 2,4-Dimethylphenol		5 J						2006	62		[illegible]			
17 Benzoic Acid		10 J							600	140 J	5000 E			
18 bis-(2-Chloroethoxy)methane														
19 2,4-Dichlorophenol							1900 E	14000 E	7600 E		1900			
20 1,2,4-Trichlorobenzene									390	500	720			
21 Naphthalene							41 J	42 J	70	250	200			1 J
22 4-Chloroaniline	120						10030 E	15000 E	4000	6400 E	810	210		
23 Hexachlorobutadiene														
24 4-Chloro-3-methylphenol														
25 2-Methylnaphthalene										21 J	47 J			
26 Hexachlorocyclopentadiene														
27 2,4,6-Trichlorophenol							4100	6000	1800	140	1200			
28 2,4,5 Trichlorophenol										27 J	[illegible] J			
29 2-Chloronaphthalene														
30 2-Nitroaniline							1700	1800	2000					

CER 051723

E000351

Ground Water Semivolatiles

SITE	SITE 1	BLANK	SITE 1	SITE 6	SITE 6	SITE 6	SITE 6	BLANK	SITE [illegible]	SITE [illegible]	SITE 8	SITE 8	SITE 8	SITE 8	SITE 6
SAMPLE NUMBER	BC-GW-29 *	BC-GW-30 *	BC-GW-31	BC-GW-32	BC-GW-33	BC-GW-34	BC-GW-34A	BC-GW-35 *	BC-GW-36	BC-GW-37	BC-GW-38	BC-GW-38A	BC-GW-39	BC-GW-39A	BC-GW-40
WELL NUMBER	GG-12		GG-20	GG-11	GG-6106	GG-6102	GG-6102		GG-6110	GG-6109	GG-20	GG-21	GG-22	GG-22	GG-23
DATE SAMPLED	3-23-87	3-23-87	3-23-87	3-24-87	3-24-87	3-24-87	7-14-87	3-24-87	3-24-87	3-24-87	3-24-87	7-14-87	3-24-87	7-14-87	3-24-87
1 Phenol					2 J					150			560	1100	
2 bis(2-Chloroethyl)ether														91 J	
3 2-Chlorophenol				130	9 J					130			120	28 J	
4 1,3-Dichlorobenzene	110				4 J								320	290	
5 1,4-Dichlorobenzene	830			34 J	350								10000 E	15000 E	
6 Benzyl Alcohol															
7 1,2-Dichlorobenzene	110				6 J								7000	11000 E	
8 2-Methylphenol										6 J			18 J	120	
9 bis(2-Chloroisopropyl) ether															
10 4-Methylphenol				37 J						35			820	1100	
11 N-Nitroso-n-Dipropylamine															
12 Hexachloroethane															
13 Nitrobenzene															
14 Isophorone															
15 2-Nitrophenol										41					
16 2,4-Dimethylphenol				200									[illegible]20	400	
17 Benzoic Acid															
18 bis-(2-Chloroethoxy)methane															
19 2,4-Dichlorophenol					11								36 J		
20 1,2,4-Trichlorobenzene					200								270	200	
21 Naphthalene				36 J									160	100	
22 4-Chloroaniline	70			13000 E	110				[illegible]0	60			7[illegible]0		
23 Hexachlorobutadiene															
24 4-Chloro-3-methylphenol															
25 2-Methylnaphthalene													6 J		
26 Hexachlorocyclopentadiene															
27 2,4,6-Trichlorophenol					3 J										
28 2,4,5-Trichlorophenol															
29 2-Chloronaphthalene															
30 2-Nitroaniline															

CER 051724

E000683

Ground Water Semivolatiles

SITE	PRIVATE	PRIVATE	PRIVATE	BLANK
SAMPLE NUMBER	BC-GW-34	BC-GW-35	BC-GW-36	BC-GW-37
WELL NUMBER	SCHRADER	McDONALD	CLAYTON	
DATE SAMPLED	3-26-87	3-26-87	3-26-87	7 14 87
1 Phenol				
2 bis(2-Chloroethyl)ether				
3 2-Chlorophenol				
4 1,3-Dichlorobenzene				
5 1,4-Dichlorobenzene			3 J	
6 Benzyl Alcohol				
7 1,2-Dichlorobenzene			3 J	
8 2-Methylphenol				
9 bis(2-Chloroisopropyl) ether				
10 4-Methylphenol				
11 N-Nitroso-n-Dipropylamine				
12 Hexachloroethane				
13 Nitrobenzene				
14 Isophorone				
15 2-Nitrophenol				
16 2,4-Dimethylphenol				
17 Benzoic Acid				
18 bis-(2-Chloroethoxy)methane				
19 2,4-Dichlorophenol				
20 1,2,4-Trichlorobenzene				
21 Naphthalene				
22 4-Chloroaniline				
23 Hexachlorobutadiene				
24 4-Chloro-3-methylphenol				
25 2-Methylnaphthalene				
26 Hexachlorocyclopentadiene				
27 2,4,6-Trichlorophenol				
28 2,4,5-Trichlorophenol				
29 2-Chloronaphthalene				
30 2-Nitroaniline				

CER 051725

E000883

Ground Water Semivolatiles

SITE	SITE G	SITE G	SITE B	BLANK	SITE H	SITE L	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B
SAMPLE NUMBER	DC-GW-33	DC-GW-34	DC-GW-34A	DC-GW-35 *	DC-GW-36	DC-GW-37	DC-GW-38	DC-GW-38A	DC-GW-39	DC-GW-39A	DC-GW-40	DC-GW-40A	DC-GW-41	DC-GW-41A	DC-GW-42 *	DC-GW-43
WELL NUMBER	GG-6046	EE 6102	EE 6102		EE 6110	EE 6109	EE-21	EE-21	EE-22	EE-22	EE-23	EE-23	EE-24	EE-24	EE-24	EE-25
DATE SAMPLED	3-20-87	3-20-87	7-10-87	3-20-87	3-20-87	3-20-87	3-20-87	7-10-87	3-20-87	7-10-87	3-20-87	7-10-87	3-20-87	7-10-87	3-20-87	3-20-87
1 Dimethyl Phthalate																
2 Acenaphthylene																
3 3-Nitroaniline																
4 Acenaphthene																
5 2,4-Dinitrophenol																
6 4-Nitrophenol																
7 Dibenzofuran																
8 2,4-Dinitrotoluene																
9 2,6-Dinitrotoluene																
10 Diethylphthalate																
11 4-Chlorophenyl-Phenylether																
12 Fluorene																
13 4-Nitroaniline																
14 4,6-Dinitro-2-methylphenol																
15 N-Nitrosodiphenylamine																
16 4-Bromophenyl-phenylether																
17 Hexachlorobenzene																
18 Pentachlorophenol									23 J							
19 Phenanthrene																
20 Anthracene																
21 Di-n-butyl phthalate	12 B			6 BJ		6 BJ							10 B	7 J	10 B	
22 Fluoranthene																
23 Pyrene																
24 Butyl Benzyl phthalate																
25 3,3'-Dichlorobenzidine																
26 Benzo(a)Anthracene																
27 bis(2-ethylhexyl) phthalate	4 BJ			2 BJ									3 BJ			
28 Chrysene																
29 Di-n-octyl phthalate	2 BJ			3 BJ									2 BJ		11 B	
30 Benzo(b)Fluoranthene																
31 Benzo(k)Fluoranthene																
32 Benzo(a)Pyrene																
33 Indeno(1,2,3-cd)Pyrene																
34 Benzo(g,h,i)Perylene																
35 Dibenz(a,h)Anthracene																

CER 051726

E000684

Ground Water Semivolatiles

SITE	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE H	SITE H	SITE H	SITE H	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	BC-GW-01	BC GW-02	BC GW 03	BC GW 04	BC GW-05	BC GW-06	BC-GW-07	BC GW 008	BC GW-09	BC GW 13	BC GW 11	BC GW 12	BC GW 13	BC GW 14	BC GW 15	[illegible]
WELL NUMBER	EE-06	EE-07	EE 09	EE 10	EE 17	EE 08	EE 19	EE 19	EE 18	EE 01	EE 02	EE 03	EE 04	[illegible]	[illegible]	[illegible]
DATE SAMPLED	3-16-87	3-16-87	3 16 87	3 16 87	3-16-87	3-16-87	3-16 87	3-16 87	3 16 87	3-17-87	3 17 87	3 17 87	3 17 87	3 17 87	3 17 87	[illegible]
1 Dimethyl Phthalate											8 J					
2 Acenaphthylene																
3 3-Nitroaniline							3000		460 J							
4 Acenaphthene																
5 2,4-Dinitrophenol																
6 4-Nitrophenol									80 J							
7 Dibenzofuran										6 J						
8 2,4-Dinitrotoluene																
9 2,6-Dinitrotoluene																
10 Diethylphthalate											22 J					
11 4-Chlorophenyl-Phenylether										20 J						
12 Fluorene																
13 4-Nitroaniline																
14 4,6-Dinitro-2-methylphenol																
15 N-Nitrosodiphenylamine										800						
16 4-Bromophenyl-phenylether																
17 Hexachlorobenzene																
18 Pentachlorophenol							20000 E	32000 E	310	650						
19 Phenanthrene										15 J						
20 Anthracene																
21 Di-n-butyl phthalate	12 BJ	8 BJ	5 BJ	8 BJ	5 BJ	5 BJ									2 BJ	
22 Fluoranthene																
23 Pyrene																
24 Butyl Benzyl phthalate																
25 3,3'-Dichlorobenzidine																
26 Benzo(a)Anthracene																
27 bis(2-ethylhexyl) phthalate	95	160	32		26						20 J					
28 Chrysene																
29 Di-n-octyl phthalate		7 J	4 J			2 J										
30 Benzo(b)Fluoranthene																
31 Benzo(k)Fluoranthene																
32 Benzo(a)Pyrene																
33 Indeno(1,2,3-cd)Pyrene																
34 Benzo(g,h,i)Perylene																
35 Dibenz(a,h)Anthracene																

CER 051727

E000C85

Ground Water Pest/PCBs

SITE	SITE 8	BLANK	SITE L	SITE 6	SITE 6	SITE 6	BLANK
SAMPLE NUMBER	BC-GW-16	BC-GW-17*	BC-GW-18	BC-GW-19	BC-GW-20 D	BC-GW-21	BC-GW-22 *
WELL NUMBER	EE-G104		EE G108	EE G1[illegible]	EE G107	EE 05	
DATE SAMPLED	3-17-87	3-17-87	3-18-87	3-18-87	3-18-87	3-18-87	3-18-87
1 Alpha-BHC							
2 Beta-BHC							
3 Delta-BHC							
4 Gamma-BHC (Lindane)							
5 Heptachlor							
6 Aldrin							
7 Heptachlor Epoxide							
8 Endosulfan I							
9 Dieldrin							
10 4,4'-DDE							
11 Endrin							
12 Endosulfan II							
13 4,4'-DDD							
14 Endosulfan Sulfate							
15 4,4'-DDT							
16 Methoxychlor							
17 Endrin Ketone							
18 Chlordane							
19 Toxaphene							
20 AROCLOR-1016							
21 AROCLOR-1221							
22 AROCLOR-1232							
23 AROCLOR-1242							
24 AROCLOR-1248							
25 AROCLOR-1254							
26 AROCLOR-1260				800	630		

SITE	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	BLANK
SAMPLE NUMBER	BC-GW-23	BC-GW-24	BC-GW-25	BC-GW-26	BC-GW-27	BC-GW-28	BC-GW-29 D	BC-GW-[illegible] *
WELL NUMBER	EE 13	EE 12	EE G112	EE 14	EE 15	EE 16	EE 12	
DATE SAMPLED	3-23-87	3-23-87	3-23-87	3-23-87	3-23-87	[illegible]	[illegible]	[illegible]
1 Alpha-BHC								
2 Beta-BHC								
3 Delta-BHC								
4 Gamma-BHC (Lindane)								
5 Heptachlor								
6 Aldrin								
7 Heptachlor Epoxide								
8 Endosulfan I								
9 Dieldrin								
10 4,4'-DDE								
11 Endrin								
12 Endosulfan II								
13 4,4'-DDD								
14 Endosulfan Sulfate								
15 4,4'-DDT								
16 Methoxychlor								
17 Endrin Ketone								
18 Chlordane								
19 Toxaphene								
20 AROCLOR-1016								
21 AROCLOR-1221								
22 AROCLOR-1232								
23 AROCLOR-1242								
24 AROCLOR-1248								
25 AROCLOR-1254								
26 AROCLOR-1260								

CER 051728

E000[illegible]

Ground Water Pest/PCBs

SITE	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	BLANK	PRIVATE	PRIVATE	PRIVATE	PRIVATE
SAMPLE NUMBER	BC-GW-41A	BC-GW-42 B	BC GW-43	BC-GW 43A	BC GW-44	BC-GW-45	BC-GW-46	BC GW 47	BC GW 48A	BC GW 49	BC GW 50	BC GW 51	BC GW 52	BC GW 53	BC GW 54	BC GW [illegible]
WELL NUMBER	EE-24	EE-24	EE 25	EE 25	P 1	B 28A	P 7	B 26A	B 26A	B 25A	P 11		[illegible]	[illegible]	[illegible]	[illegible]
DATE SAMPLED	7-16-87	3-24-87	3-24-87	7-16-87	3 25 87	3 25 87	3 25 87	3 25 87	3 25 87	3 25 87	3 25 87	3 25 87	[illegible] 26 87	[illegible] 26 87	[illegible] 26 87	[illegible]
1 Alpha-BHC																
2 Beta-BHC																
3 Delta-BHC																
4 Gamma-BHC (Lindane)																
5 Heptachlor																
6 Aldrin																
7 Heptachlor Epoxide																
8 Endosulfan I																
9 Dieldrin																
10 4,4'-DDE																
11 Endrin																
12 Endosulfan II																
13 4,4'-DDD																
14 Endosulfan Sulfate																
15 4,4'-DDT																
16 Methoxychlor																
17 Endrin Ketone																
18 Chlordane																
19 Toxaphene																
20 AROCLOR-1016																
21 AROCLOR-1221																
22 AROCLOR-1232																
23 AROCLOR-1242																
24 AROCLOR-1248																
25 AROCLOR-1254																
26 AROCLOR-1260																

CER 051729

E000387

Ground Water Inorganics

SITE	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	SITE H	SITE H	SITE H	SITE H	SITE 6	SITE 6
SAMPLE NUMBER	BC-GW-01	BC-GW-02	BC-GW-03	BC-GW-04	BC-GW-05	BC-GW-06	BC-GW-07	BC-GW-08 B	BC-GW-09	BC-GW-10	BC-GW-11	BC-GW-12	BC-GW-13	BC-GW-14	BC-GW-15
WELL NUMBER	EE-06	EE-07	EE-20	EE-10	EE-17	EE-08	EE-19	EE-19	EE-18	EE-01	EE-02	EE-03	[illegible]	[illegible]	[illegible]
DATE SAMPLED	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-16-87	3-17-87	3-17-87	3-17-87	3-17-87	3-17-87	3-17-87
1 Aluminum											11800				
2 Antimony															[illegible]
3 Arsenic	64	82	10	100			11	11	15		8490	26			
4 Barium	384	682		330		336								219	
5 Beryllium															
6 Boron															
7 Cadmium											10 B				
8 Chromium, trivalent									15		20				
9 Cobalt									140		750				
10 Copper											2410				
11 Iron	8060	34000	12000	20000	571	11300	36700	36500	61200	29600	160000	34900		1200	1170
12 Lead											28 B				
13 Manganese	1320	1600	322	1000	1640	13200	2660	2600	6630	967	8020	1030	1000	2250	202
14 Mercury														1.4	2.1
15 Nickel	64	74							112	261	11200				
16 Selenium															
17 Silver															
18 Thallium															
19 Tin															
20 Vanadium															
21 Zinc	25	326	26	22	313	40	172	171	4.31	57	6840	25	26	41	62
22 Cyanide	1560									460	21			151	131

CER 051730

E000658

INORGANICS GROUND WATER

SITE	SITE 1	SITE 6	SITE 6	SITE 6	SITE 6	BLANK	SITE 8	SITE L	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8
SAMPLE NUMBER	DC-GW-31	DC-GW-32	DC-GW-33	DC-GW-34	DC-GW-34A	DC-GW-35	DC-GW-36	DC-GW-37	DC-GW-38	DC-GW-38A	DC-GW-39	DC-GW-39A	DC-GW-40	DC-GW-40A	DC-GW-41	DC-GW-41A
WELL NUMBER	EE 20	EE-11	EE 6106	EE 6102	EE 6102		EE 110	EE 6109	EE 21	EE 21	EE 22	EE 22	EE 23	EE 23	EE 24	EE 24
DATE SAMPLED	3-25-87	3-20-87	3-24-87	3-24-87	7-14-87	3-24-87	3-24-87	3-24-87	3-24-87	7-14-87	3-24-87	7-14-87	3-24-87	7-14-87	3-24-87	7-14-87
1 Aluminum		85								2000						
2 Antimony																
3 Arsenic		170	34	37				10000	16		133	123	25	17	18	13
4 Barium			192	60	(511)		173		159	(351)	336	500	(1611)	(1121)	(1701)	204
5 Beryllium																
6 Boron																
7 Cadmium								32			8	11				
8 Chromium, trivalent			41													
9 Cobalt					(101)			84								
10 Copper																
11 Iron	124	43000	69300	3030	2060	111	2160	523000	20400	13700	147050	171000	19600	16800	36400	29200
12 Lead										3270		6350				
13 Manganese		2290	3040	1460	1240		276	7660	4300		5460		1270	1350	4110	1520
14 Mercury																
15 Nickel			37	72			111									
16 Selenium																
17 Silver																
18 Thallium																
19 Tin																
20 Vanadium								150			42	55			204	
21 Zinc		129	30	14	31	10	33	2210	41	37	101	60	95	(151)	25	24
22 Cyanide		26							20							

CER 051731

E000659

Ground Water Inorganics

SITE

SAMPLE NUMBER
WELL NUMBER
DATE SAMPLED

1 Aluminum
2 Antimony
3 Arsenic
4 Barium
5 Beryllium
6 Boron
7 Cadmium
8 Chromium, trivalent
9 Cobalt
10 Copper
11 Iron
12 Lead
13 Manganese
14 Mercury
15 Nickel
16 Selenium
17 Silver
18 Thallium
19 Tin
20 Vanadium
21 Zinc
22 Cyanide

CER 051732

E000690

Surface Water Volatiles

SITE	SITE A	SITE A	SITE A	CS B	CS B	CS B	CS C	CS C	CS B	CS B		CS A	CS A
SAMPLE NUMBER	DC-SW-01 *	DC-SW-02	DC-SW-03	DC-SW-04	DC-SW-05	DC-SW-06 *	DC-SW-07	DC-SW-08	DC-SW-09	DC-SW-13	DC-SW-11 *	DC-SW-12	DC-SW-1[illegible]
DATE	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-6-86	11-6-86
1 Chloromethane													
2 Bromomethane													
3 Vinyl Chloride													
4 Chloroethane													
5 Methylene Chloride	6 B	3 BJ	3 BJ	3 BJ	3 BJ	3 BJ	3 BJ	6 B	5 B	7 B	6 B	4 BJ	4
6 Acetone	12 B		7 BJ	9 BJ	12 B	11 B	13 B	13 B	11 B	11 B	17 B	[illegible] B	6
7 Carbon Disulfide													
8 1,1-Dichloroethene													
9 1,1-Dichloroethane													3
10 trans-1,2-Dichloroethene													
11 Chloroform	27										[illegible]	8	7
12 1,2-Dichloroethane													
13 2-Butanone (MEK)													
14 1,1,1-Trichloroethane												35	41
15 Carbon Tetrachloride													31
16 Vinyl Acetate													
17 Bromodichloromethane													
18 1,2-Dichloropropane													
19 trans-1,3-Dichloropropene													
20 Trichloroethene												6	16
21 Dibromochloromethane													
22 1,1,2-Trichloroethane													
23 Benzene												1 J	
24 cis-1,3-Dichloropropene													
25 2-Chloroethyl Vinyl Ether													
26 Bromoform													
27 4-Methyl-2-pentanone												4 J	
28 2-Hexanone													
29 Tetrachloroethene													
30 1,1,2,2-Tetrachloroethane													
31 Toluene													
32 Chlorobenzene												[illegible] J	
33 Ethylbenzene													
34 Styrene													
35 Total Xylenes												[illegible] J	

CER 051733

E000691

Surface Water Semivolatiles

SITE	BLANK	SITE B	SITE B	CS B	CS B	CS B	CS C	CS C	CS B	CS B	BLANK	CS A	CS A
SAMPLE NUMBER	BC-SW-01	BC-SW-02	BC-SW-03	BC-SW-04	BC-SW-05	BC-SW-06	BC-SW-07	BC-SW-08	BC-SW-09	BC-SW-10	BC-SW-11	BC-SW-12	BC-SW-13
DATE	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-85	11-6-86	11-6-86	11-6-86
1 Dimethyl Phthalate													
2 Acenaphthylene													
3 3-Nitroaniline													
4 Acenaphthene													
5 2,4-Dinitrophenol													
6 4-Nitrophenol													
7 Dibenzofuran													
8 2,4-Dinitrotoluene													
9 2,6-Dinitrotoluene													
10 Diethylphthalate							3 J						
11 4-Chlorophenyl-Phenylether													
12 Fluorene													
13 4-Nitroaniline													
14 4,6-Dinitro-2-methylphenol													
15 N-Nitrosodiphenylamine													
16 4-Bromophenyl-phenylether													
17 Hexachlorobenzene													
18 Pentachlorophenol													
19 Phenanthrene												4 J	
20 Anthracene													
21 Di-n-butyl phthalate	13 B	26 B	25 B	18 B	15 B	16 B	18 B	19 B	19 B	20 B	17 B	5 BJ	27 B
22 Fluoranthene													
23 Pyrene													
24 Butyl Benzyl phthalate												17 J	
25 3,3'-Dichlorobenzidine													
26 Benzo(a)Anthracene													
27 bis(2-ethylhexyl) phthalate												7 J	[illegible] J
28 Chrysene													
29 Di-n-octyl phthalate		4 J	2 J							1 J		16 J	1 J
30 Benzo(b)Fluoranthene													
31 Benzo(k)Fluoranthene													
32 Benzo(a)Pyrene													
33 Indeno(1,2,3-cd)Pyrene													
34 Benzo(g,h,i)Perylene													
35 Dibenz(a,h)Anthracene													

CER 051734

E000692

Surface Water Inorganic

SITE	BLANK	SITE A	SITE A	CS-B	CS-B	CS-B	CS-C	CS-C	CS-D	CS-D	BLANK	CS-A	CS-A
SAMPLE NUMBER	BC-SW-01 *	BC-SW-02	BC-SW-03	BC-SW-04	BC-SW-05	BC-SW-06 *	BC-SW-07	BC-SW-08	BC-SW-09	BC-SW-10	BC-SW-11 *	BC-SW-12	BC-SW-1[illegible]
DATE	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-6-86	11-6-86
1 Aluminum		664		1090	204	9000		767	5000	1170	325	[illegible]	[illegible]
2 Antimony		—										115	
3 Arsenic						31							
4 Barium		300				7130			276				
5 Beryllium													
6 Boron													
7 Cadmium						25			0.1			[illegible]	[illegible]
8 Chromium, trivalent		10				99			12			81	65
9 Cobalt													
10 Copper		31	46	660	239	17900	226	84	619	57		7050	2410
11 Iron	255	937	350	1310	695	24500	520	2790	7670	1570		2040	720
12 Lead		6.4		77	17	1300	710	30	89	36		3060	76
13 Manganese		97	95	180	66	222	141	234	196	20		68	252
14 Mercury				0.6			1.9	0.2	0.26			0.39	0.2
15 Nickel		46				1200	85		109			2600	667
16 Selenium													
17 Silver												16	
18 Thallium													
19 Tin						60		60				699	
20 Vanadium													
21 Zinc		186	73	604	367	10300	537	267	1090	185		1650	600
22 Cyanide													

CER 051735

E0000693

Sediment Volatiles

SITE	CS-B	CS-B	SITE A	SITE A	SITE A	CS-B	CS-B	CS-B	CS-C	CS-C	CS-C	CS-C	CS-B	CS-B	CS-B
SAMPLE NUMBER	BC-SD-13 D	BC-SD-14	BC-SD-15	BC-SD-16	BC-SD-17	BC-SD-18 D	BC-SD-19	BC-SD-20	BC-SD-21	BC-SD-22	BC-SD-23	BC-SD-24	BC-SD-25	BC-SD-26	BC-SD-27
SAMPLE DEPTH	0-6"	2-3	0-6"	0-6"	0-6"	0-6"	0-6"	1.5-2	0-6"	2-2.5	0-6"	2-2.5	0-6"	1.5-2	0-6"
DATE SAMPLED	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	[illegible]	[illegible]	[illegible]	[illegible]
1 Chloromethane															
2 Bromomethane															
3 Vinyl Chloride															
4 Chloroethane															
5 Methylene Chloride	11000 B	2200 B	7000 B	10000 B	8400 B	12000 B	13000 B	14000 B	19000 B	18000 B	27000 B	17000 B	[illegible] B	19000 B	[illegible] B
6 Acetone	15000 B	830	9900 B	5100 B	5600 B	6100 JB	10000 B	6100 B	6600 B	9900 B	15000 B	7500 B	[illegible] B	9300 B	[illegible]
7 Carbon Disulfide															
8 1,1-Dichloroethene															
9 1,1-Dichloroethane															
10 trans-1,2-Dichloroethene															
11 Chloroform															
12 1,2-Dichloroethane															
13 2-Butanone (MEK)	21000 B	310	11000	10000	13000	10000	10000	10000 B	11000 B	16000 B	22000 B	12000 B	21000 B	16000 B	[illegible] B
14 1,1,1-Trichloroethane															
15 Carbon Tetrachloride															
16 Vinyl Acetate															
17 Bromodichloromethane															
18 1,2-Dichloropropane															
19 trans-1,3-Dichloropropene															
20 Trichloroethene															
21 Dibromochloromethane															
22 1,1,2-Trichloroethane															
23 Benzene		87 J													
24 cis-1,3-Dichloropropene															
25 2-Chloroethyl Vinyl Ether															
26 Bromoform															
27 4-Methyl-2-pentanone		220 J													
28 2-Hexanone							52000 B			1200 J					
29 Tetrachloroethene															
30 1,1,2,2-Tetrachloroethane															
31 Toluene		840													
32 Chlorobenzene		5200													
33 Ethylbenzene		3600													
34 Styrene															
35 Total Xylenes		990													

CER 051736

E000694

Sediment Semivolatiles

SITE	CS B	CS B	SITE B	SITE B	SITE B	CS B	CS D	CS D	CS C	CS C	CS E	CS E	CS D	CS D
SAMPLE NUMBER	BC-SD-13 D	BC-SD-14	BC-SD-15	BC-SD-16	BC-SD-17	BC-SD-18 D	BC-SD-19	BC-SD-20	BC-SD-21	BC-SD-22	BC-SD-23	BC-SD-24	BC-SD-25	BC-SD-26
SAMPLE DEPTH	0-6"	2-3	0-6"	0-6"	0-6"	0-6"	0-6"	1.5-2	0-6"	2-2.5	0-6"	2-2.5	0-6"	1.5-2
DATE SAMPLED	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86
1 Phenol											500 J	81 J		
2 bis(2-Chloroethyl)ether														
3 2-Chlorophenol														
4 1,3-Dichlorobenzene										110 J				
5 1,4-Dichlorobenzene		220000					130 J			690 J				
6 Benzyl Alcohol														
7 1,2-Dichlorobenzene		17000 J												
8 2-Methylphenol														
9 bis(2-Chloroisopropyl) ether														
10 4-Methylphenol														
11 N-Nitroso-n-Dipropylamine														
12 Hexachloroethane														
13 Nitrobenzene														
14 Isophorone														
15 2-Nitrophenol														
16 2,4-Dimethylphenol														
17 Benzoic Acid														
18 bis-(2-Chloroethoxy)methane														
19 2,4-Dichlorophenol														
20 1,2,4-Trichlorobenzene		5400 J					390 J	76 J		260 J	130 J	64 J		
21 Naphthalene	660 J	9500 J				190 J	120 J			330 J	160 J			
22 4-Chloroaniline														
23 Hexachlorobutadiene														
24 4-Chloro-3-methylphenol														
25 2-Methylnaphthalene		8400 J								100 J				
26 Hexachlorocyclopentadiene														
27 2,4,6-Trichlorophenol														
28 2,4,5-Trichlorophenol														
29 2-Chloronaphthalene														
30 2-Nitroaniline														

CER 051737

E000695

Sediment Semivolatiles

SITE	CS D	CS D	BIIE B	BIIE B	BIIE B	CB D	CB D	CS D	CS C	CS C	CS C	CS C	CS D	CS D
SAMPLE NUMBER	BC-SD-12 B	BC-SD-14	BC-SD-15	BC-SD-16	BC-SD-17	BC-SD-18 A	BC-SD-19	BC-SD-20	BC-SD-21	BC-SD-22	BC-SD-23	BC-SD-24	BC-SD-25	BC-SD-26
SAMPLE DEPTH	0-6"	2-3	0-6"	0-6"	0-6"	0-6"	0-6"	1.5-2'	0-6"	2-2.5	0-6"	2-2.5	0-6"	1.5-2
DATE SAMPLED	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene										130 J				
5 2,4-Dinitrophenol														
6 4-Nitrophenol		2600 J												
7 Dibenzofuran														
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate														
11 4-Chlorophenyl-Phenylether														
12 Fluorene		3900 J								370 J				
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine														
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene							1900	210 J						
18 Pentachlorophenol							900 J	270 J						
19 Phenanthrene		15000 J							200 J	810 J		220 J		
20 Anthracene										500 J				
21 Di-n-butyl phthalate			380 B	370 BJ	260 J	300 J		200 J				170 J	130 J	79 J
22 Fluoranthene		11000 J								6600		370 J		150 J
23 Pyrene		13000 J				1600 J		91 J	400 J	6500		290 J		170 J
24 Butyl Benzyl phthalate						830 J								
25 3,3'-Dichlorobenzidine														
26 Benzo(a)Anthracene						430 J			300 J	3300	650 J	230 J		
27 bis(2-ethylhexyl) phthalate	9900 J	9500 J		340 J	150 J	3300		95 J	700 J		660 J			72 J
28 Chrysene						1200 J		160 J	550 J	4400	1000	[illegible] J		65 J
29 Di-n-octyl phthalate		2600 J	120 J	270 J		940 J		96 J		130 J				
30 Benzo(b)Fluoranthene		3600 J					2600			7500	2000	1000		200 J
31 Benzo(k)Fluoranthene	720 J					1500 J		610 J	920	600 J				
32 Benzo(a)Pyrene	1100 J	1000 J				690 J	310 J	95 J	680 J	4500	940	550 J		86 J
33 Indeno(1,2,3-cd)Pyrene						830 J	1000 J	200 J	390 J	4300	1700	330 J		100 J
34 Benzo(g,h,i)Perylene							390 J			1500 J	640 J	110 J		
35 Dibenz(a,h)Anthracene						1000 J	1800	210 J	550 J	6000	1700	470 J		91 J

Sediment Pest/PCBs

SITE	CS B	CS D	SITE A	SITE A	SITE B	CS D	CS-D	CS D	CS C	CS C	CS C	CS C	CS B	CS B	CS B
SAMPLE NUMBER	DC-SD-13 D	DC-SD-14	DC-SD-15	DC-SD-16	DC-SD-17	DC-SD-18 D	DC-SD-19	DC-SD-20	DC-SD-21	DC-SD-22	DC-SD-23	DC-SD-24	DC-SD-25	DC-SD-26	DC-SD-27
SAMPLE DEPTH	0-6"	2'-3'	0-6"	0-6"	0-6"	0-6"	0-6"	1.5'-2'	0-6"	2'-2.5'	0-6"	2'-2'	0-6"	1.5'-2'	0-6"
DATE SAMPLED	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86
1 Alpha-BHC															
2 Beta-BHC															
3 Delta-BHC															
4 Gamma-BHC (Lindane)															
5 Heptachlor															
6 Aldrin															
7 Heptachlor Epoxide															
8 Endosulfan I															
9 Dieldrin															
10 4,4'-DDE															
11 Endrin															
12 Endosulfan II															
13 4,4'-DDD															
14 Endosulfan Sulfate															
15 4,4'-DDT															
16 Methoxychlor															
17 Endrin Ketone															
18 Chlordane															
19 Toxaphene															
20 AROCLOR-1016															
21 AROCLOR-1221															
22 AROCLOR-1232															
23 AROCLOR-1242				20000											
24 AROCLOR-1248		400000 C	660	8820	5200					8700					
25 AROCLOR-1254			670		4200		141000 C	16000 C		9300	11000	1600 J			7700
26 AROCLOR-1260	10200 J	66000 C	430 J		2700 J	7700	50000 JC	3600 JC		5400 J	7800 J				6500

CER 051739

E000697

Sediment Inorganic

SITE	CS-B	CS-B	SITE B	SITE B	SITE B	CS B	CS-B	CS-B
SAMPLE NUMBER	BC-SD-13 D	BC-SD-14	BC SD 15	BC SD 16	BC-SD 17	BC SD 18 D	BC SD-19	BC-SD 20
SAMPLE DEPTH	0-6"	2'-3'	0-6"	0-6"	0-6"	0-6"	0-6"	1.5'-2'
DATE SAMPLED	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86
1 Aluminum	4000	6300	6300	2030	7510	5300	9730	12900
2 Antimony								
3 Arsenic	14 B	20 B	3.6 B	12 B	16 B	16 B	21	13 B
4 Barium	610	1100	126	131	176	667	17300	3120
5 Beryllium								
6 Boron								
7 Cadmium	22	36	1.5	11	8	24	30	0.2
8 Chromium, trivalent	62	133	13	37	33	70	118	113
9 Cobalt	6.6	9.2	7.7	7.2	5	6	11	6.9
10 Copper	8700 B	6700 B	167 B	1270 B	1700 B	8600 B	15300 B	2610 B
11 Iron	16000	19500	11100	26600	10000	16300	50200	21300
12 Lead	855	954	26	65	71	985	1460	330
13 Manganese	107	155	100	97	139	210	82	70
14 Mercury	0.75	1.3	0.13	0.56	0	0.9	1.60	0.80
15 Nickel	36 BB	502 BB	356 BB	220 BB	309 BB	82	1520 BB	867 BB
16 Selenium	3.3	4.1				6	2	
17 Silver	10	11				14	15	
18 Thallium							4	
19 Tin	32	20		23			16	
20 Vanadium	23	27	19		19	24	40	25
21 Zinc	3310	6650	860	872	1010	3410	11900	6610
22 Cyanide		3.0						

SITE	CS C	CS C	CS C	CS C	CS B	CS B	CS B
SAMPLE NUMBER	BC SD 21	BC SD 22	BC SD 23	BC SD 24	BC SD 25	BC SD 26	BC SD 27
SAMPLE DEPTH	0-6"	2'-2.5'	0-6"	2'-2.5'	0-6"	1'-2'	0-6"
DATE SAMPLED	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86	11-5-86
1 Aluminum	12600	7530	8450	12600	11250	12500	6400
2 Antimony							
3 Arsenic	5.1 B	9 B	33 B	30 B	1.7 B	7.8 B	4.7 B
4 Barium	376	570	1700	1610	2.9	622	214
5 Beryllium							
6 Boron							
7 Cadmium	17	34	27	42	12	42	[illegible]
8 Chromium, trivalent	41	64	34	68	35	48	34
9 Cobalt	7.5	10	6.6	7.2	5	12	
10 Copper	5800 B	5710 B	6509 B	2000 B	370 B	[illegible] B	[illegible] B
11 Iron	10000	18000	32000	20000	22000	[illegible]	[illegible]
12 Lead	467	595	975	661	146	[illegible]	[illegible]
13 Manganese	177	96	161	151	190	272	170
14 Mercury	0.71	0.95	1.60	2.01	1	0.89	0.74
15 Nickel	116 BB	830 BB	1490 BB	700 BB	170 BB	665 BB	[illegible] BB
16 Selenium				2.5			
17 Silver							
18 Thallium							
19 Tin							
20 Vanadium	32	27	27	56	37	2	
21 Zinc	1370	15600	6800	6430	1010	[illegible]	[illegible]
22 Cyanide							

CER 051740

E0006698

Surface Soil Volatiles

SITE	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	DC-SS-16 D	DC-SS-17	DC-SS-18	DC-SS-19	DC-SS-20	DC-SS-21	DC-SS-22	DC-SS-23	DC-SS-24	DC-SS-25 D	DC-SS-26	DC-SS-27	DC-SS-28	DC-SS-29	DC-SS-30
LOCATION/GRID	G-3	H-3	A-4	B-4	C-4	D-4	E-4	F-4	G-4	G-4	H-4	I-4	J-4	A-5	B-5
DATE SAMPLED	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86
1 Chloromethane															
2 Bromomethane															
3 Vinyl Chloride															
4 Chloroethane															
5 Methylene Chloride	36 B	90 B	36 B	81 B	73 B	160 B	62 B	50 B	71 B	79 B	60 B	[illegible]	[illegible]	60 B	[illegible]
6 Acetone	20 BJ	13 BJ	67 B	140 B	99 B	600 B		41	39 B	90	14 BJ	17 BJ	[illegible]	27 B	[illegible]
7 Carbon Disulfide															
8 1,1-Dichloroethene															
9 1,1-Dichloroethane															
10 trans-1,2-Dichloroethene															
11 Chloroform															
12 1,2-Dichloroethane															
13 2-Butanone (MEK)	66 B			180 B				42			90 B	46 B	56 B	56 B	
14 1,1,1-Trichloroethane															
15 Carbon Tetrachloride															
16 Vinyl Acetate															
17 Bromodichloromethane															
18 1,2-Dichloropropane															
19 trans-1,3-Dichloropropene															
20 Trichloroethene															
21 Dibromochloromethane															
22 1,1,2-Trichloroethane															
23 Benzene															
24 cis-1,3-Dichloropropene															
25 2-Chloroethyl Vinyl Ether															
26 Bromoform															
27 4-Methyl-2-pentanone			55	220 B	310 B	160	49 B		320	610					47
28 2-Hexanone				17 BJ	30 B	23 BJ	20 BJ	20 J	31 B						
29 Tetrachloroethene				13 J		60 J					12 J				
30 1,1,2,2-Tetrachloroethane															
31 Toluene										65	37				
32 Chlorobenzene															
33 Ethylbenzene															
34 Styrene															
35 Total Xylenes															

CER 051742

E000700

Surface Soil Volatiles

	SITE	SITE 3	SITE 3	SITE 3
	SAMPLE NUMBER	BC-SS-66	BC-SS-67	BC-SS-68A
	LOCATION/GRID	SE	NE	NE
	DATE SAMPLED	11-13-86	11-13-86	11-13-86
1	Chloromethane			
2	Bromomethane			
3	Vinyl Chloride			
4	Chloroethane			
5	Methylene Chloride	60 B	32 B	24 B
6	Acetone	18 BJ	33 B	12 BJ
7	Carbon Disulfide			
8	1,1-Dichloroethene			
9	1,1-Dichloroethane			
10	trans-1,2-Dichloroethene			
11	Chloroform			
12	1-2-Dichloroethane			
13	2-Butanone (MEK)	34 B	30 B	35 B
14	1,1,1-Trichloroethane			
15	Carbon Tetrachloride			
16	Vinyl Acetate			
17	Bromodichloromethane			
18	1,2-Dichloropropane			
19	trans-1,3-Dichloropropene			
20	Trichloroethene			
21	Dibromochloromethane			
22	1,1,2-Trichloroethane			
23	Benzene			
24	cis-1,3-Dichloropropene			
25	2-Chloroethyl Vinyl Ether			
26	Bromoform			
27	4-Methyl-2-pentanone			
28	2-Hexanone			
29	Tetrachloroethene			
30	1,1,2,2-Tetrachloroethane			
31	Toluene			
32	Chlorobenzene			
33	Ethylbenzene			
34	Styrene			
35	Total Xylenes			

CER 051743

EC00701

Surface Soils Semivolatiles

SITE	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	BC-SS-15	BC-SS-16	BC-SS-17	BC-SS-18	BC-SS-19	BC-SS-20	BC-SS-21	BC-SS-22	BC-SS-23	BC-SS-24	BC-SS-25	BC-SS-26	BC-SS-27	BC-SS-28
LOCATION/GRID	G-5	G-3	H-3	A-4	B-4	C-4	D-4	E-4	F-4	G-4	G-4	H-4	I-4	J-4
DATE SAMPLED	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86
1 Phenol									70 J					
2 bis(2-Chloroethyl)ether														
3 2-Chlorophenol														
4 1,3-Dichlorobenzene														
5 1,4-Dichlorobenzene							22000000							
6 Benzyl Alcohol														
7 1,2-Dichlorobenzene									89 J					
8 2-Methylphenol														
9 bis(2-Chloroisopropyl) ether														
10 4-Methylphenol														
11 N-Nitroso-n-Dipropylamine														
12 Hexachloroethane														
13 Nitrobenzene														
14 Isophorone														
15 2-Nitrophenol														
16 2,4-Dimethylphenol														
17 Benzoic Acid														
18 bis-(2-Chloroethoxy)methane														
19 2,4-Dichlorophenol									120 J					
20 1,2,4-Trichlorobenzene			990 J						180 J				110 J	180 J
21 Naphthalene			130000			1000 J			110 J					
22 4-Chloroaniline														
23 Hexachlorobutadiene														
24 4-Chloro-3-methylphenol														
25 2-Methylnaphthalene														
26 Hexachlorocyclopentadiene														
27 2,4,6-Trichlorophenol														
28 2,4,5-Trichlorophenol														
29 2-Chloronaphthalene														
30 2-Nitroaniline									1000 J					[illegible]

CER 051744

E0007702

Surface Soils Semivolatiles

SITE	BLANK	BLANK	SITE J	SITE J	SITE J
SAMPLE NUMBER	BC-SS-44*	BC-SS-45*	BC-SS-46	BC-SS-47	BC-SS-48D
LOCATION/GRID			SE	NE	NE
DATE SAMPLED	11-13-86	11-11-86	11-13-86	11-13-86	11-13-86
1 Phenol					
2 bis(2-Chloroethyl)ether					
3 2-Chlorophenol					
4 1,3-Dichlorobenzene					
5 1,4-Dichlorobenzene					
6 Benzyl Alcohol					
7 1,2-Dichlorobenzene					
8 2-Methylphenol					
9 bis(2-Chloroisopropyl) ether					
10 4-Methylphenol					
11 N-Nitroso-n-Dipropylamine					
12 Hexachloroethane					
13 Nitrobenzene					
14 Isophorone					
15 2-Nitrophenol					
16 2,4-Dimethylphenol					
17 Benzoic Acid					
18 bis-(2-Chloroethoxy)methane					
19 2,4-Dichlorophenol					
20 1,2,4-Trichlorobenzene					
21 Naphthalene					
22 4-Chloroaniline					
23 Hexachlorobutadiene					
24 4-Chloro-3-methylphenol					
25 2-Methylnaphthalene					
26 Hexachlorocyclopentadiene					
27 2,4,6-Trichlorophenol					
28 2,3,5-Trichlorophenol					
29 2-Chloronaphthalene					
30 2-Nitroaniline					

CER 051745

E000703

Surface Soil Semivolatiles

SITE	SITE 8	SITE 6	SITE 8	SITE 8	SITE 8	SITE 8	SITE 6	SITE 8	SITE 6	SITE 6	SITE 6	SITE 8	SITE 6	SITE 6
SAMPLE NUMBER	BC-SS-15	BC-SS-16	BC-SS-17	BC-SS-18	BC-SS-19	BC-SS-20	BC-SS-21	BC-SS-22	BC-SS-23	BC-SS-24	BC-SS-25	BC-SS-26	BC-SS-27	BC-SS-28
LOCATION/GRID	G-3	B-3	H-3	A-4	B-4	C-4	D-4	E-4	F-4	G-4	G-4	H-4	I-4	J-4
DATE SAMPLED	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene		3000 J	1100 J						70 J					
5 2,4-Dinitrophenol														
6 4-Nitrophenol														
7 Dibenzofuran														
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate														
11 4-Chlorophenyl-Phenylether														
12 Fluorene														
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine														
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene			10000 J											
18 Pentachlorophenol	1200000	1600000							12000		18000 J			[illegible] J
19 Phenanthrene	60000 J	37000 J	8700 J						1200				180 J	
20 Anthracene									300 J					
21 Di-n-butyl phthalate						3000 BJ		360 BJ	1700 B				1,0 BJ	
22 Fluoranthene	44000	45000							2200		6700 J	4200 J		
23 Pyrene	83000	71000	3000 J						850	5300 J	9000 J			
24 Butyl benzyl phthalate														
25 3,3'-Dichlorobenzidine		86000												
26 Benzo(a)Anthracene		27000 J							960		5100 J			
27 bis(2-ethylhexyl) phthalate									660					
28 Chrysene	39000 J	39000 J							1100		6400 J		270 J	
29 Di-n-octyl phthalate								140 BJ	99 BJ					
30 Benzo(b)Fluoranthene	47000	68000							1800					
31 Benzo(k)Fluoranthene										10000 J	10000 J			
32 Benzo(a)Pyrene	22000 J	20000 J							840		4500 J			
33 Indeno(1,2,3-cd)Pyrene									1100					
34 Benzo(g,h,i)Perylene									430					
35 Dibenz(a,h)Anthracene									1200					

CER 051746

E000704

Surface Soil Semivolatiles

SITE	BLANK	BLANK	SITE J	SITE J	SITE J
SAMPLE NUMBER	BC-SS-44*	BC-SS-45*	BC-SS-46	BC-SS-47	BC-SS-48D
LOCATION/GRID			SE	NE	NE
DATE SAMPLED	11-13-86	11-11-86	11-13-86	11-13-86	11-13-86
1 Dimethyl Phthalate					
2 Acenaphthylene					
3 3-Nitroaniline					
4 Acenaphthene					
5 2,4-Dinitrophenol					
6 4-Nitrophenol					
7 Dibenzofuran					
8 2,4-Dinitrotoluene					
9 2,6-Dinitrotoluene					
10 Diethylphthalate					
11 4-Chlorophenyl-Phenylether					
12 Fluorene					
13 4-Nitroaniline					
14 4,6-Dinitro-2-methylphenol					
15 N-Nitrosodiphenylamine					
16 4-Bromophenyl-phenylether					
17 Hexachlorobenzene					
18 Pentachlorophenol					
19 Phenanthrene					
20 Anthracene					
21 Di-n-butyl phthalate	130 J	1300 B	1600 B	230 J	
22 Fluoranthene					
23 Pyrene					
24 Butyl Benzyl phthalate					
25 3,3'-Dichlorobenzidine					
26 Benzo(a)Anthracene					
27 bis(2-ethylhexyl) phthalate			240 J		
28 Chrysene					
29 Di-n-octyl phthalate		79 BJ			
30 Benzo(b)Fluoranthene	81 J				
31 Benzo(k)Fluoranthene					
32 Benzo(a)Pyrene					
33 Indeno(1,2,3-cd)Pyrene					
34 Benzo(g,h,i)Perylene					
35 Dibenz(a,h)Anthracene					

E0000705

CER 051747

Surface Soils Pest/PCBs

SITE	SITE 6	SITE 8	SITE 6	SITE 8	SITE 8	SITE 8	SITE 8	SITE 6	SITE 8	SITE 8	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	BC-SS-16 D	BC-SS-17	BC-SS-18	BC-SS-19	BC-SS-20	BC-SS-21	BC-SS-22	BC-SS-23	BC SS-24	BC SS-25 D	BC SS 26	BC SS 27	BC SS 28	BC SS-29	BC SS [illegible]
LOCATION/GRID	B-3	H-3	A-4	D-4	C-4	D-4	E-4	F-4	G 4	G 4	H 4	I 4	J 4	A 5	B 5
DATE SAMPLED	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86
1 Alpha-BHC															
2 Beta-BHC															
3 Delta-BHC															
4 Gamma-BHC (Lindane)															
5 Heptachlor															
6 Aldrin															
7 Heptachlor Epoxide															
8 Endosulfan I															
9 Dieldrin															
10 4,4'-DDE															
11 Endrin															
12 Endosulfan II															
13 4,4'-DDD															
14 Endosulfan Sulfate															
15 4,4'-DDT															
16 Methoxychlor															
17 Endrin Ketone															
18 Chlordane															
19 Toxaphene															
20 AROCLOR-1016															
21 AROCLOR-1221															
22 AROCLOR-1232															
23 AROCLOR-1242															
24 AROCLOR-1248	171000		1700000	3600000 C			145000 JC	110000 C						21000	[illegible]
25 AROCLOR-1254				7300000 C		2700000							240000 J		
26 AROCLOR-1260	313000 J	3700000 JC		8000000 C	630000		347000 C	210000 C	117000 J	122000 J	120000	2200000 C	670000	21000	[illegible]

CER 051748

E000706

Surface Soils Pest/PCBs

SITE	SITE J	SITE J	SITE J
SAMPLE NUMBER	BC-SS-46	BC-SS-47	BC-SS-48 I
LOCATION/GRID	SE	NE	NE
DATE SAMPLED	11-13-86	11-13-86	11-13-86
1 Alpha-BHC			
2 Beta-BHC			
3 Delta-BHC			
4 Gamma-BHC (Lindane)			
5 Heptachlor			
6 Aldrin			
7 Heptachlor Epoxide			
8 Endosulfan I			
9 Dieldrin			
10 4,4'-DDE			
11 Endrin			
12 Endosulfan II			
13 4,4'-DDD			
14 Endosulfan Sulfate			
15 4,4'-DDT			
16 Methoxychlor			
17 Endrin Ketone			
18 Chlordane			
19 Toxaphene			
20 AROCLOR-1016			
21 AROCLOR-1221			
22 AROCLOR-1232			
23 AROCLOR-1242			
24 AROCLOR-1248			
25 AROCLOR-1254			
26 AROCLOR-1260			

CER 051749

E000707

Surface Soil Inorganic

SITE	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 8	SITE 6	SITE 6	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	DC-SS-15	DC-SS-16 J	DC-SS-17	DC-SS-18	DC-SS-19	DC-SS-20	DC-SS-21	DC-SS-22	DC-SS-23	DC-SS-24	DC-SS-25 J	DC SS 26	DC SS 27	DC SS 28
LOCATION/GRID	B-3	B-3	B-3	A-4	B-4	C-4	D-4	E-4	F-4	G 4	G 4	H 4	I 4	J 4
DATE SAMPLED	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86	11-11-86
1 Aluminum	6060	6370	[illegible]	9860	4790	9450	[illegible]	6990	9620	4470	5720	16300	5040	10900
2 Antimony	14	21												
3 Arsenic	36 B	30 B	33 B	64 B	57 B	40 B	14 B	23 B	22 B	39 J	24 J	11 J	10 J	11 J
4 Barium	1160	7800	1800	13000	1010	7700	10000	19300	4340	6320	2220	3190	1460	1030
5 Beryllium														1.4
6 Boron														
7 Cadmium	46	45	37	7.2	10	11	3	0.7	20	17 BJ	20 BJ	21 BJ	27 BJ	3.7 BJ
8 Chromium, trivalent	147	98	66	137	47	34	44	86	40	44 BJ	50 BJ	137 BJ	22 BJ	92 BJ
9 Cobalt	11	11	7.3	13	3.0	6.7	12	10	30		[5.6]	[6.3]	[5.2]	[3.9]
10 Copper	2130	1620	940	246	637	630	444	600	1920	1400	1900	1020	640	4000
11 Iron	73000	100000	66000	66000	40600	23000	33600	13900	30900	26000 J	29200 J	33900 J	20700 J	35000 J
12 Lead	1200 J	1610 J	1020 J	207 J	263 J	1070 J	402 J	206 J	11700 J	610 J	437 J	300 J	443 J	871 J
13 Manganese	770	870	300	193	273	100	136	270	10000	184 BJ	200 BJ	326 BJ	239 BJ	247 BJ
14 Mercury	3.2	3.0	6.6	0.57	12	2.3	3	2.7	11	1.02	1.13	1.6	26	3
15 Nickel	122	100	87	95	84	30	52	33	50	105 J	135 J	60 J	34 J	86 J
16 Selenium					3									
17 Silver	6.4	3.4	6.1			3.3			33	3.7 BJ	3.4 BJ	3.5 BJ		
18 Thallium					21									
19 Tin	30	34			163						16			43
20 Vanadium	133	100	211	25	19900	20	69	41	166	64	75	100	59	75
21 Zinc	22000	13600	3600	32100	3.9	46700	800	7100	24200	32200	41400	4660	4520	5700
22 Cyanide	1.6						4.4	3.2	2.7	1.3	1.7			2.2

CER 051750

E000705

Surface Soil Inorganic

SITE	BLANK	BLANK	SITE J	SITE J	SITE J
SAMPLE NUMBER	BC-SS-04*	BC-SS-03*	BC-SS-06	BC-SS-07	BC-SS-08
LOCATION/GRID			SE	NE	NE
DATE SAMPLED	11-13-86	11-13-86	11-13-86	11-13-86	11-13-86
1 Aluminum	7520	9260	8860	630	634
2 Antimony					
3 Arsenic		7 B	3.3 J	9.1 J	6.4 J
4 Barium	441	306	346	25	26
5 Beryllium					
6 Boron					
7 Cadmium	1.5 B	1.6	2.3 B	13 B	9.9 B
8 Chromium, trivalent	11 B	13	133 B	690 B	300 B
9 Cobalt	(4.1)	4.9		(19)	(13)
10 Copper	33	34	135	610	(615)
11 Iron	13400 J	16200	37500 J	262000 J	201000
12 Lead	60 J	68 J	34 J	21 J	38 J
13 Manganese	336 B	308	627 B	7600 B	1030 B
14 Mercury			0.44		
15 Nickel	13 J	16	30 J	330 J	377 J
16 Selenium					
17 Silver					
18 Thallium					
19 Tin					
20 Vanadium	19	22			
21 Zinc	170	162	63	66	34
22 Cyanide					

CER 051751

E000709

Subsurface Soils Volatiles

SITE	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	BC-64-26	BC-61-27	BC-60-29	BC-62-30	BC-62-31	BC-63-33	BC-60-34	BC-64-35	BC-64-36	BC-65-37	BC-66-67	BC-60-68	[illegible]	BC-68-70	[illegible]
SAMPLE DEPTH	0-10'	10'-20'		5'-15'	5'-15'	10'-20'		5'-20'	5'-20'	5'-15'	20'-30'		[illegible]	10'-29'	[illegible]
DATE SAMPLED	1-12-87	1-12-87	1-14-87	1-14-87	1-14-87	1-26-87	1-26-87	1-26-87	1-26-87	1-27-87	2-25-87	[illegible]	[illegible]	2-24-87	[illegible]
1 Chloromethane															
2 Bromomethane															
3 Vinyl Chloride															
4 Chloroethane															
5 Methylene Chloride	8 BJ	15 B	9 BJ	6221 B	7112 B	662 B	4 BJ	3 BJ	3 BJ	851 BJ	1482 BJ	46 B	[illegible]	671 BJ	[illegible]
6 Acetone	32 B	266 B		4699 B	3448 BJ	10500 B	20 B	1980 EB	2250 EB	3302 B	4110 B	10 B	[illegible]	12027 B	[illegible]
7 Carbon Disulfide															
8 1,1-Dichloroethene															
9 1,1-Dichloroethane															
10 trans-1,2-Dichloroethene														700 J	
11 Chloroform															[illegible]
12 1-2-Dichloroethane											655 J				
13 2-Butanone (MEK)	36 B	29 B	27 B	15200 B	17700 B	9100 B		22 B	15 B	5603 B	8941 B	27 B	9692 B	17206	[illegible]
14 1,1,1-Trichloroethane															
15 Carbon Tetrachloride															
16 Vinyl Acetate															
17 Bromodichloromethane															
18 1,2-Dichloropropane															
19 trans-1,3-Dichloropropene															
20 Trichloroethene										762 J	1141 J		5646	2000 J	
21 Dibromochloromethane															
22 1,1,2-Trichloroethane															
23 Benzene								3 J	5 J	10160	9002		[illegible]	5141	[illegible]
24 cis-1,3-Dichloropropene															
25 2-Chloroethyl Vinyl Ether															
26 Bromoform															
27 4-Methyl-2-pentanone										655 J	1176 J		6154	6008	
28 2-Hexanone															
29 Tetrachloroethene		9 J		13970	5207					3556	11767		[illegible]	[illegible]	[illegible]
30 1,1,2,2-Tetrachloroethane															
31 Toluene				806 J						27900	117687		58467	12143	91
32 Chlorobenzene				584 J		1600		107	150	2613	27959 B	1 J	[illegible]	100000 B	[illegible]
33 Ethylbenzene						168 J				1265 J	900 J		1692	14286	[illegible]
34 Styrene															
35 Total Xylenes						92				2796	2235		[illegible]	15714	[illegible]

CER 051752

E000740

Subsurface Soils Volatiles

SITE	SITE 1	SITE 1	SITE 1	BLANK	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1
SAMPLE NUMBER	BC-15-01	BC 15 02	BC-16-03	BC-18-04	BC-17-05	BC 17 06	BC 17-07 D	BC-19 08	BC 19 09	BC 110 50	BC 111 51	BC 111 52	BC 112 53	BC 112 50	[illegible]
SAMPLE DEPTH	5'-27.5'	20'-30'	10'-25'		3.5'-12.5'	13'-23'	13'-23'	6'-23'	20'-30'	15'-30'	6'-20'	26'-39'	[illegible]	10.5'-27.5'	[illegible]
DATE SAMPLED	1-30-87	1-30-87	2-2 87	2 3 87	2 3 87	2-3 87	2-3 87	2 4 87	2 4 87	[illegible] 4 87	2 5 87	[illegible]	[illegible]	[illegible]	[illegible]
1 Chloromethane															
2 Bromomethane															
3 Vinyl Chloride															
4 Chloroethane															
5 Methylene Chloride	5207 D	5310 D	1047 DJ	6 b	7 b	15 b	15 b	1117 DJ	[illegible]	436 bJ	[illegible] bJ	46 b	17 b	17 b	[illegible]
6 Acetone	10501 D	6726 D	13390 b	10 Jb	1950 ED	850 ED	916 ED	13377 D	5207 b	6400 b	13061 b	708 b	1461 DE	547 DE	[illegible]
7 Carbon Disulfide															
8 1,1-Dichloroethene															
9 1,1-Dichloroethane															
10 trans-1,2-Dichloroethene					5 J										
11 Chloroform															
12 1-2-Dichloroethane															
13 2-Butanone (MEK)	13970 D	9704 D	9702 D	10	30		23	10731 D	4039 D	8640 D	14696 D	168 D	12 b	27 b	
14 1,1,1-Trichloroethane										632 J					
15 Carbon Tetrachloride															
16 Vinyl Acetate															
17 Bromodichloromethane															
18 1,2-Dichloropropane															
19 trans-1,3-Dichloropropene															
20 Trichloroethene	3010									640 J					
21 Dibromochloromethane															
22 1,1,2-Trichloroethane															
23 Benzene	24130	637 J	2156					1000 J	107 J	1040 J	5540	[illegible] J			
24 cis-1,3-Dichloropropene															
25 2-Chloroethyl Vinyl Ether															
26 Bromoform															
27 4-Methyl-2-pentanone			4130											1 bJ	
28 2-Hexanone															
29 Tetrachloroethene	2667	2950								612 J					
30 1,1,2,2-Tetrachloroethane															
31 Toluene	24130 D	1637 JD	5007					77910	1393 D	3120	1037	40			
32 Chlorobenzene	65720	14160	7034		10			3230	915	2640	[illegible]	2040			
33 Ethylbenzene	9770	3060	5002					500 J	203 J	8160	[illegible] J	96			
34 Styrene															
35 Total Xylenes	11040	1652 J	4130					867 J	102 J	2760	[illegible] J	80			

CER 051753

E000211

Subsurface Soils Volatiles

SITE	SITE P	SITE P	SITE P	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	BLANK	SITE B	SITE [illegible]	SITE B	SITE B	SITE [illegible]
SAMPLE NUMBER	BC-P2-54	BC-P5-55	BC-P5-56 D	BC-01-59	BC-02-60	BC-03-61	BC-04-62	BC-05-63	BC-05-64 D	BC-00-65 [illegible]	BC-06-66	[illegible]	[illegible]	[illegible]	[illegible]
SAMPLE DEPTH	25'-35'	10'-25'	10'-25'	15'-25'	20'-30'	10'-20'	0-10'	0.5'-20'	0.5'-20'		15'-25'	[illegible]	[illegible]	[illegible]	[illegible]
DATE SAMPLED	2-11-87	2-12-87	2-12-87	2-16-87	2-17-87	2-17-87	2-17-87	2-17-87	2-17-87	[illegible]	2-18-87	[illegible]	[illegible]	[illegible]	[illegible]
1 Chloromethane															
2 Bromomethane															
3 Vinyl Chloride															
4 Chloroethane															
5 Methylene Chloride	5 BJ	2 BJ	5 BJ		35	10 J	855 BJ		10 J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6 Acetone	1036 BE	333 BE	613 BE	[illegible]	[illegible]	4465 BE	3692 B	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]
7 Carbon Disulfide															
8 1,1-Dichloroethene															
9 1,1-Dichloroethane					10 J										
10 trans-1,2-Dichloroethene					192	6 J									
11 Chloroform															
12 1-2-Dichloroethane					23										
13 2-Butanone (MEK)	76 B	22 B	26 B	30 B	25641 BE	36 B	7179 B	244 B	171 B		20 B		[illegible]	[illegible]	[illegible]
14 1,1,1-Trichloroethane							1660								
15 Carbon Tetrachloride															
16 Vinyl Acetate															
17 Bromodichloromethane															
18 1,2-Dichloropropane															
19 trans-1,3-Dichloropropene															
20 Trichloroethene					69										
21 Dibromochloromethane															
22 1,1,2-Trichloroethane															
23 Benzene					667	24	30769		10 J					[illegible]	
24 cis-1,3-Dichloropropene															
25 2-Chloroethyl Vinyl Ether															
26 Bromoform															
27 4-Methyl-2-pentanone	29 B				1244 B		3602								
28 2-Hexanone	2 BJ				63										
29 Tetrachloroethene															
30 1,1,2,2-Tetrachloroethane					28										
31 Toluene							29487					[illegible]		[illegible]	
32 Chlorobenzene					1667	62	30462	74	159			[illegible]		[illegible]	[illegible]
33 Ethylbenzene					66	167	366667 E	37 J	57 J			[illegible]	[illegible]	[illegible]	[illegible]
34 Styrene															
35 Total Xylenes					161	976	615385 E	244	256			[illegible]	[illegible]	[illegible]	[illegible]

CER 051754

E000712

Subsurface Soils Semivolatiles

SITE	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6
SAMPLE NUMBER	BC-61-26	BC-61-27	BC-60-29 +	BC-62-30	BC-62-31 +	BC-63-33	BC-60-34	BC-64-35	BC-64-36	BC-65-37 +	BC-66-67	BC-66-68 +	BC-67-69	BC-68-70
SAMPLE DEPTH	0-10'	10'-20'		5'-15'	5'-15'	10'-20'		5'-20'	5'-20	5-15	20-30		10-20	10-20
DATE SAMPLED	1-12-87	1-12-87	1-14-87	1-14-87	1-14-87	1-26-87	1-26-87	1-26-87	1-26-87	1-27-87	2-25-87	2-24-87	2-24-87	2-26-87
1 Phenol										177000				
2 bis(2-Chloroethyl)ether														
3 2-Chlorophenol										8763 J				
4 1,3-Dichlorobenzene														
5 1,4-Dichlorobenzene				3556 J				2176	1750 J					
6 Benzyl Alcohol										6695 J				
7 1,2-Dichlorobenzene														
8 2-Methylphenol										3556 J				
9 bis(2-Chloroisopropyl) ether														
10 4-Methylphenol														
11 N-Nitroso-n-Dipropylamine														
12 Hexachloroethane														
13 Nitrobenzene														
14 Isophorone														
15 2-Nitrophenol														
16 2,4-Dimethylphenol														
17 Benzoic Acid														
18 bis-(2-Chloroethoxy)methane														
19 2,4-Dichlorophenol										38100	14110 J			141679 J
20 1,2,4-Trichlorobenzene										7874 J	103529		120000 J	
21 Naphthalene				4953 J	4826 J					254000	301176		109251 J	5420571
22 4-Chloroaniline										5969 J			231769 J	
23 Hexachlorobutadiene														
24 4-Chloro-3-methylphenol														
25 2-Methylnaphthalene										13970 J	8706 J			3714 J
26 Hexachlorocyclopentadiene														
27 2,4,6-Trichlorophenol										49530				
28 2,4,5-Trichlorophenol														
29 2-Chloronaphthalene														
30 2-Nitroaniline														

CER 051755

E000713

Subsurface Soils Semivolatiles

SITE	SITE I	SITE I	SITE I	SITE I	SITE I	BLANK	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I
SAMPLE NUMBER	BC-12-39	BC-13-40	BC-13-41	BC-13-42	BC-16-43	BC-10-44	BC-17-45	BC-17-46	BC-17-47 D	BC-19-48	BC-19-49	BC-110-50	BC-111-51	BC-111-52
SAMPLE DEPTH	5'-25'	5'-15'	5'-27.5'	20'-30'	10'-25'	-	3.5'-12.5'	13'-23'	13'-23'	6'-23'	20'-30'	15'-30'	6'-20'	26'-[illegible]
DATE SAMPLED	1-28-87	1-29-87	1-30-87	1-30-87	2-2-87	2-3-87	2-3-87	2-3-87	2-3-87	2-4-87	2-4-87	2-4-87	2-5-87	2-5-87
1 Phenol	27000 J				15206 J									
2 bis(2-Chloroethyl)ether														
3 2-Chlorophenol														
4 1,3-Dichlorobenzene	10900 J												70140	
5 1,4-Dichlorobenzene	32000	3666 J	550000	22420	72300								[illegible]	[illegible] J
6 Benzyl Alcohol														
7 1,2-Dichlorobenzene	320000	2670 J	130700 J	6090 J	15000 J									
8 2-Methylphenol														
9 bis(2-Chloroisopropyl) ether														
10 4-Methylphenol														
11 N-Nitroso-n-Dipropylamine														
12 Hexachloroethane														
13 Nitrobenzene														
14 Isophorone														
15 2-Nitrophenol														
16 2,4-Dimethylphenol														
17 Benzoic Acid	62100 J													
18 bis-(2-Chloroethoxy)methane														
19 2,4-Dichlorophenol												9000 J		
20 1,2,4-Trichlorobenzene	1082000		8252000 E	637200 E	477400							116000	[illegible]	112000
21 Naphthalene	30000		63300 J	1100 J	44440 J					510500	1045 J			
22 4-Chloroaniline			43100 J											
23 Hexachlorobutadiene														
24 4-Chloro-3-methylphenol														
25 2-Methylnaphthalene	7020 J		30420 J	1700 J	160000					2000 J			23100 J	
26 Hexachlorocyclopentadiene														
27 2,4,6-Trichlorophenol														
28 2,4,5-Trichlorophenol														
29 2-Chloronaphthalene														
30 2-Nitroaniline														

CER 051756

E000714

Subsurface Soils Semivolatiles

SITE	SITE H	SITE H	BLANK	SITE P	SITE P	SITE P	SITE P	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	BLANK
SAMPLE NUMBER	BC-H1-05	BC-H2-06	BC-HB-07 +	BC-P1-53	BC-P2-54	BC-P3-55	BC-P3-56 D	BC-B1-59	BC-B2-60	BC-B3-61	BC-B4-62	BC-B5-63	BC-B5-64 D	BC-BB-65
SAMPLE DEPTH	0-10'	5'-15'		0-10'	25'-35'	10'-25	10'-25'	15'-25'	20'-30'	10'-20	0-10'	0'-20	0'-20	
DATE SAMPLED	12-15-86	12-15-86	12-16-86	2-11-87	2-11-87	2-12-87	2-12-87	2-16-87	2-17-87	2-17-87	2-17-87	2-17-87	2-17-87	2-18-87
1 Phenol				3075 J										
2 bis(2-Chloroethyl)ether														
3 2-Chlorophenol														
4 1,3-Dichlorobenzene														
5 1,4-Dichlorobenzene				8075 J										
6 Benzyl Alcohol														
7 1,2-Dichlorobenzene				3625 J							24559 J			
8 2-Methylphenol														
9 bis(2-Chloroisopropyl) ether														
10 4-Methylphenol														
11 N-Nitroso-n-Dipropylamine														
12 Hexachloroethane														
13 Nitrobenzene														
14 Isophorone														
15 2-Nitrophenol														
16 2,4-Dimethylphenol														
17 Benzoic Acid														
18 bis(2-Chloroethoxy)methane														
19 2,4-Dichlorophenol														
20 1,2,4-Trichlorobenzene											26425 J			
21 Naphthalene											[illegible]4615 J			
22 4-Chloroaniline														
23 Hexachlorobutadiene														
24 4-Chloro-3-methylphenol														
25 2-Methylnaphthalene											160236			
26 Hexachlorocyclopentadiene														
27 2,4,6-Trichlorophenol														
28 2,4,5-Trichlorophenol														
29 2-Chloronaphthalene														
30 2-Nitroaniline														

CER 051757

E000745

Subsurface Soils Contamination

SITE	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6
SAMPLE NUMBER	BC-61-26	BC-61-27	BC-60-29	BC-62-30	BC-62-31	BC-63-33	BC-60-34	BC-64-35	BC-64-36	BC-65-37	BC-66-67	BC-66-66	BC-67-69	BC-68-70
SAMPLE DEPTH	0-10'	10'-20'		5'-15'	5'-15'	10'-20'		5'-20'	5'-20'	5'-15'	20'-30'		10'-20'	19'-20'
DATE SAMPLED	1-12-87	1-12-87	1-14-87	1-14-87	1-14-87	1-26-87	1-26-87	1-26-87	1-26-87	1-27-87	2-23-87	2-24-87	2-24-87	2-24-87
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene														
5 2,4-Dinitrophenol														
6 4-Nitrophenol														
7 Dibenzofuran													33846 J	
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate														22073
11 4-Chlorophenyl-Phenylether														
12 Fluorene														
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine										177000				
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene				46600	27900									
18 Pentachlorophenol				630000 E	990000						23529 J		47697 J	107714 J
19 Phenanthrene										26670	12901 J			31029 J
20 Anthracene														
21 Di-n-butyl phthalate	279 BJ	293 BJ	368 BJ								17647 J	10000 B		
22 Fluoranthene											6500 J			
23 Pyrene										19650				
24 Butyl Benzyl phthalate														
25 3,3'-Dichlorobenzidine														
26 Benzo(a)Anthracene														
27 bis(2-ethylhexyl) phthalate														
28 Chrysene										22060				
29 Di-n-octyl phthalate														
30 Benzo(b)Fluoranthene														
31 Benzo(k)Fluoranthene														
32 Benzo(a)Pyrene														
33 Indeno(1,2,3-cd)Pyrene														
34 Benzo(g,h,i)Perylene														
35 Dibenz(a,h)Anthracene														

CER 051758

E000726

Subsurface Soils Semivolatiles

SITE	SITE I	SITE I	SITE I	SITE I	SITE I	BLANK	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I
SAMPLE NUMBER	BC-12-39	BC-13-40	BC-15-41	BC-15-42	BC-16-43	BC-18-44	BC-17-45	BC-17-46	BC-17-47	BC-19-48	BC-19-49	BC-110-50	BC-111-51	BC-111-52
SAMPLE DEPTH	5'-25'	5'-15'	5'-27.5'	20'-70'	10'-25'		3.5'-12.5'	13'-25'	13'-23'	6'-25'	24'-30'	[illegible]	[illegible]	[illegible]
DATE SAMPLED	1-28-87	1-29-87	1-30-87	1-30-87	2-2-87	2-3-87	2-3-87	2-3-87	2-3-87	2-4-87	2-4-87	2-4-87	2-?-87	2-5-87
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene					10010									
5 2,4-Dinitrophenol														
6 4-Nitrophenol														
7 Dibenzofuran										3586 J				
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate					16900 J									
11 4-Chlorophenyl-Phenylether														
12 Fluorene					35420 J					6176 J	3675 J			
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine	43900 J		160330 J											
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene	117650		1270000	177000	32340 J							100000	[illegible]	46000
18 Pentachlorophenol														
19 Phenanthrene			48000 J		308000 J					12495 J				1520 J
20 Anthracene			203200		23600 J									
21 Di-n-butyl phthalate			203200		36960 J	9720	15600	8500	10660		10332			11200
22 Fluoranthene			203200		10000 J									
23 Pyrene			20000 J		60200 J					2205 J				
24 Butyl benzyl phthalate			130000 J											
25 3,3'-Dichlorobenzidine														
26 Benzo(a)Anthracene												6770 J		
27 bis(2-ethylhexyl) phthalate	31030 J				130000			2375			5535		4040 J	11000
28 Chrysene									5500					
29 Di-n-octyl phthalate														
30 Benzo(b)Fluoranthene					32430 J									
31 Benzo(k)Fluoranthene														
32 Benzo(a)Pyrene														
33 Indeno(1,2,3-cd)Pyrene														
34 Benzo(g,h,i)Perylene														
35 Dibenz(a,h)Anthracene														

CER 051759

E000727

Subsurface Soils Semivolatiles

SITE	SITE H	SITE H	BLANK	SITE P	SITE P	SITE P	SITE P	SITE D	SITE D	SITE D	SITE D	SITE D	SITE D	BLANK
SAMPLE NUMBER	BC-H1-05	BC-H2-06	BC-H0-07	BC-P1-53	BC-P2-54	BC-P5-55	BC-P5-56 D	BC-D1-59	BC-D2-60	BC-D3-61	BC-D4-62	BC-D5-63	BC-D5-64 D	BC-B0-65
SAMPLE DEPTH	0-10'	5'-15'		0-10'	25'-35'	10'-25'	10'-25'	15'-25'	20'-30'	10-20'	0-10	4.5-20	6.5-[illegible]	
DATE SAMPLED	12-15-86	12-15-86	12-16-86	2-11-87	2-11-87	2-12-87	2-12-87	2-16-87	2-17-87	2-17-87	2-17-87	2-17-87	2-17-87	2-18-87
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene														
5 2,4-Dinitrophenol														
6 4-Nitrophenol														
7 Dibenzofuran														
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate														
11 4-Chlorophenyl-Phenylether														
12 Fluorene														
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine											300000 J			
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene														
18 Pentachlorophenol										22619	474159 J			
19 Phenanthrene	436	305 J									217969	965 J		
20 Anthracene										5337				
21 Di-n-butyl phthalate				16250 J	135 J	63 J	325 J	5207				3700 J		2785 J
22 Fluoranthene	604	233 J									43790 J			
23 Pyrene	553	215 J									202051			
24 Butyl Benzyl phthalate														
25 3,3'-Dichlorobenzidine														
26 Benzo(a)Anthracene	263 J										126195			
27 bis(2-ethylhexyl) phthalate	936	1266					225 J	1379 BJ		1905 BJ			[illegible]	
28 Chrysene	276 J										202051		1971 J	
29 Di-n-octyl phthalate														
30 Benzo(b)Fluoranthene	209 J	152 J									196067 J			
31 Benzo(k)Fluoranthene														
32 Benzo(a)Pyrene	211 J										66663 J			
33 Indeno(1,2,3-cd)Pyrene														
34 Benzo(g,h,i)Perylene											123566 J			
35 Dibenz(a,h)Anthracene														

CER 051760

E000715

Subsurface Soils Semivolatiles

SITE	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	BLANK	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1	SITE 1
SAMPLE NUMBER	BC-12-39	BC-13-40	BC-15-41	BC-15-42	BC-16-43	BC-18-44	BC-17-45	BC-17-46	BC-17-47 R	BC-19-48	BC-19-49	BC-110-50	BC-111-51	BC-111-52
SAMPLE DEPTH	5'-25'	5'-15'	5'-27.5'	20'-30'	10'-25'		3.5-12.5'	13-25'	13-25'	6-25	24-30	[illegible]	5-24	26-30
DATE SAMPLED	1-28-87	1-29-87	1-30-87	1-30-87	2-2-87	2-3-87	2-3-87	2-3-87	2-3-87	2-4-87	2-4-87	[illegible]	[illegible]	[illegible]
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene					14014									
5 2,4-Dinitrophenol														
6 4-Nitrophenol														
7 Dibenzofuran										5586 J				
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate					16900 J									
11 4-Chlorophenyl-Phenylether														
12 Fluorene					35420 J					6174 J	5675 J			
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine	43900 J		100330 J											
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene	117650		1270000	177000	32540 J							[illegible]	[illegible]	[illegible]
18 Pentachlorophenol														
19 Phenanthrene			68000 J		101600 J					12495 J				1520 J
20 Anthracene			203200		25400 J									
21 Di-n-butyl phthalate			203200		36960 J	9720	15600	8500	10660		10332			11700
22 Fluoranthene			203200		10000 J									
23 Pyrene			26000 J		49200 J					2205 J				
24 Butyl Benzyl phthalate			139000 J											
25 3,3'-Dichlorobenzidine														
26 Benzo(a)Anthracene												6720 J		
27 bis(2-ethylhexyl) phthalate	31050 J				150900			2375			5535		[illegible] J	11000
28 Chrysene									5500					
29 Di-n-octyl phthalate														
30 Benzo(b)Fluoranthene					32430 J									
31 Benzo(k)Fluoranthene														
32 Benzo(a)Pyrene														
33 Indeno(1,2,3-cd)Pyrene														
34 Benzo(g,h,i)Perylene														
35 Dibenz(a,h)Anthracene														

CER 051761

E000249

Subsurface Soils Semivolatiles

SITE	SITE N	SITE N	BLANK	SITE P	SITE P	SITE P	SITE P	SITE O	SITE O	SITE O	SITE O	SITE O	SITE O	BLANK
SAMPLE NUMBER	OC-N1-05	OC-N2-06	OC-BB-07 *	OC-P1-53	OC-P2-54	OC-P5-55	OC-P5-56 B	OC-O1-59	OC-O2-60	OC-O3-61	OC-O4-62	OC-O5-63	OC-O7-64 B	OC-O8-65 *
SAMPLE DEPTH	0-10'	5'-15'		6-10'	25'-35'	10'-25	10'-25'	15'-25'	20'-30'	13'-20	0-10	4.5'-20	8.5'-2[illegible]	
DATE SAMPLED	12-15-06	12-15-06	12-16-06	2-11-07	2-11-07	2-12-07	2-12-07	2-16-07	2-17-07	2-17-07	2-17-07	2-17-07	2-17-07	2-18-07
1 Dimethyl Phthalate														
2 Acenaphthylene														
3 3-Nitroaniline														
4 Acenaphthene														
5 2,4-Dinitrophenol														
6 4-Nitrophenol														
7 Dibenzofuran														
8 2,4-Dinitrotoluene														
9 2,6-Dinitrotoluene														
10 Diethylphthalate														
11 4-Chlorophenyl-Phenylether														
12 Fluorene														
13 4-Nitroaniline														
14 4,6-Dinitro-2-methylphenol														
15 N-Nitrosodiphenylamine											50000 J			
16 4-Bromophenyl-phenylether														
17 Hexachlorobenzene														
18 Pentachlorophenol										22619	476550 J			
19 Phenanthrene	634	303 J									217949	962 J		
20 Anthracene										5357				
21 Di-n-butyl phthalate				16250 J	155 J	63 J	325 J	5287				3780 J		2785 J
22 Fluoranthene	600	253 J									65390 J			
23 Pyrene	555	215 J									282654			
24 Butyl benzyl phthalate														
25 3,3'-Dichlorobenzidine														
26 Benzo(a)Anthracene	263 J										121795			
27 bis(2-ethylhexyl) phthalate	934	1266					225 J	1379 BJ		1905 BJ			2019 JB	
28 Chrysene	276 J										202051		1971 J	
29 Di-n-octyl phthalate														
30 Benzo(b)Fluoranthene	209 J	152 J									79667 J			
31 Benzo(k)Fluoranthene														
32 Benzo(a)Pyrene	211 J										66667 J			
33 Indeno(1,2,3-cd)Pyrene														
34 Benzo(g,h,i)Perylene											57264 J			
35 Dibenzo(a,h)Anthracene														

Subsurface Soils Pest/PCBs

SITE	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6	SITE 6	BLANK	SITE 6	SITE 6	SITE 6
SAMPLE NUMBER	BC-61-26	BC 61 27	BC 60 29 +	BC 62 30	BC 62 31 0	BC-63-33	BC 60 34	BC 64 35	BC 64 36	BC 65 37 0	BC 66 67	BC 60 68 +	BC 67 69	BC 68 70	[illegible]
SAMPLE DEPTH	0-10'	10 -20'		5 15	5 15	10 -20'		5 20	5 20	5 15	20 30		[illegible]	[illegible]	[illegible]
DATE SAMPLED	1-12-87	1-12-87	1-14-87	1-14-87	1-14-87	1-26-87	1-26-87	1-26-87	1-26-87	1-27-87	2-25-87	[illegible]	[illegible]	[illegible]	[illegible]
1 Alpha-BHC															
2 Beta-BHC															
3 Delta-BHC															
4 Gamma-BHC (Lindane)															
5 Heptachlor															
6 Aldrin															
7 Heptachlor Epoxide															
8 Endosulfan I															
9 Dieldrin															
10 4,4'-DDE				3073	3603						52941		[illegible] J		
11 Endrin															
12 Endosulfan II															
13 4,4'-DDD															
14 Endosulfan Sulfate															
15 4,4'-DDT															
16 Methoxychlor															
17 Endrin Ketone															
18 Chlordane															
19 Toxaphene															
20 AROCLOR-1016															
21 AROCLOR-1221															
22 AROCLOR-1232															
23 AROCLOR-1242															
24 AROCLOR-1248															[illegible]
25 AROCLOR-1254															
26 AROCLOR-1260	130 J						1792 J			57150	764706		[illegible] J	4420571	[illegible]

CER 051763

E0007[illegible]1

Subsurface Soils Pest/PCBs

SITE	SITE I	SITE I	SITE I	BLANK	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	SITE I	[illegible]
SAMPLE NUMBER	DC-15-41	DC-15-42	DC-16-43	DC-18-44	DC-17-45	DC-17-46	DC-17-47 R	DC-19-48	DC-19-49	DC-110-50	DC-111-51	DC-111-52	DC-112-53	DC-112-50	[illegible]
SAMPLE DEPTH	5-27.5'	20-30'	16-25		2.5-12.5'	15-25'	15-25	6-25'	20-30	15-30	6-20	[illegible]	[illegible]	14.5-[illegible]	[illegible]
DATE SAMPLED	1-30-87	1-30-87	2-2-87	2-3-87	2-3-87	2-3-87	2-3-87	2-4-87	2-4-87	2-4-87	2-5-87	[illegible]	[illegible]	[illegible]	[illegible]
1 Alpha-BHC															
2 Beta-BHC															
3 Delta-BHC															
4 Gamma-BHC (Lindane)															
5 Heptachlor															
6 Aldrin															
7 Heptachlor Epoxide															
8 Endosulfan I															
9 Dieldrin															
10 4,4'-DDE															
11 Endrin															
12 Endosulfan II															
13 4,4'-DDD								29694	6602						
14 Endosulfan Sulfate															
15 4,4'-DDT									4305						
16 Methoxychlor															
17 Endrin Ketone															
18 Chlordane															
19 Toxaphene			692000												
20 AROCLOR-1016															
21 AROCLOR-1221															
22 AROCLOR-1232															
23 AROCLOR-1242															
24 AROCLOR-1248															
25 AROCLOR-1254															
26 AROCLOR-1260	547900 J	86100								20400 J					

CER 051764

E000722

Subsurface Soils Pest/PCBs

SITE	SITE P	SITE P	SITE P	SITE B	SITE B	SITE B	SITE B	SITE B	SITE B	BLANK	SITE U	SITE U	SITE U	SITE U	SITE [illegible]
SAMPLE NUMBER	BC-P2-54	BC P5 55	BC P5 56 D	BC 01 59	BC 02 60	BC 03 61	BC 04 62	BC 05 63	BC 05 64 D	BC 08 65 [illegible]	BC 06 66	BC [illegible] 72	BC [illegible] 73	BC 010 74	[illegible]
SAMPLE DEPTH	25'-35'	10'-25	10'-25	15'-25'	20'-30'	10'-20'	0-10'	0.5'-20'	0.5'-20		15'-25'	0-10	[illegible]	5'-15'	[illegible]
DATE SAMPLED	2-11-87	2-12-87	2-12-87	2-16-87	2-17-87	2-17-87	2-17-87	2-17-87	2-17-87	2-18-87	2-16-87	2-26-87	2-26-87	2-26-87	[illegible]
1 Alpha-BHC															
2 Beta-BHC															
3 Delta-BHC															
4 Gamma-BHC (Lindane)															
5 Heptachlor															
6 Aldrin															
7 Heptachlor Epoxide															
8 Endosulfan I															
9 Dieldrin															
10 4,4'-DDE															
11 Endrin															
12 Endosulfan II															
13 4,4'-DDD															
14 Endosulfan Sulfate															
15 4,4'-DDT															
16 Methoxychlor															
17 Endrin Ketone															
18 Chlordane															
19 Toxaphene															
20 AROCLOR-1016															
21 AROCLOR-1221															
22 AROCLOR-1232								26829 C	34366						
23 AROCLOR-1242							1071795					[illegible]	[illegible]	[illegible]	[illegible]
24 AROCLOR-1248															
25 AROCLOR-1254															
26 AROCLOR-1260								5400 JC	3902 J						

CER 051765

E000723

Subsurface Soil Inorganics

SITE	SITE H	SITE H	SITE H	SITE H	SITE H	SITE H	BLANK	SITE H	SITE H	SITE H	SITE H	SITE H	SITE I	SITE I	SITE I
SAMPLE NUMBER	DC-01-14	DC-01-15	DC-02-16	DC-03-17	DC-03-18 D	DC-04-19	DC-00-20 *	DC-05-21	DC-06-22	DC-07-23	DC-08-24	DC-09-25	DC-11-38	DC-12-39	DC-13-40
SAMPLE DEPTH	15'-25'	35'-50'	5'-20'	10'-20'	10'-20'	10'-25'		0-10'	35-50'	35-50'	5-15	15-25	[illegible]	5-25	5-15'
DATE SAMPLED	12-10-86	12-10-87	1-5-87	1-6-87	1-6-87	1-6-87	1-7-87	1-7-87	1-8-87	1-8-87	1-9-87	1-13-87	1-21-87	[illegible]	[illegible]
1 Aluminum	2003	1052	4015	450	697	7167	10074	7074	2011	2202	12117	2203	13540	1257	[illegible]
2 Antimony															
3 Arsenic	26 B	3 B	7 B	15 B	13 B	300 B	6 B	42 B			4 B	5 B	11		6
4 Barium	3202	30	1079	85	97	607	372	330	55	46	210	52	2633	919	[illegible]
5 Beryllium															
6 Boron															
7 Cadmium	232		5			706		221					11	6	2
8 Chromium, trivalent	100	4	97			34	15	56	6	5	10		115	15	16
9 Cobalt	19	3	105			47	6	8						7	14
10 Copper	374	3	415	13	12	2444	79	972			51		629	64	[illegible]
11 Iron	40226	3010	80345	310	344	54167	15641	27160	5905	4741	20519	[illegible]	[illegible]	[illegible]	[illegible]
12 Lead	1150 B	4 B	170 B	5 B	4 B	4300 B	44 B	3027 B	4 B	3 B	60 B	5 B	171 B	61 B	[illegible]
13 Manganese	2003	34	621	7	9	2292	376	36343	70	71	336	66	256 B	96 B	404 B
14 Mercury	0.8					3.9					1.4		2.2	1.5	
15 Nickel	15097	90	290	6	4	2003	17	42	9	9	16		111	904	26
16 Selenium	2														
17 Silver	4 B					9		44							
18 Thallium								1							
19 Tin	111		16			00							55		55
20 Vanadium	95					20	27	20	9	7	27		553	30	42
21 Zinc	39346	39	200	8	10	3075	153	8099	23	15	340	26	6329	441	[illegible]
22 Cyanide	2		2												

CER 051766

E000724

Subsurface Soil Inorganics

SITE	SITE J	SITE J	SITE K	SITE K	SITE K	BLANK	SITE L	SITE L	SITE L	SITE L	SITE L	SITE M	SITE M	BLANK	SITE P
SAMPLE NUMBER	BC-J2-12	BC-J3-13	BC-K1-08	BC-K2-25	BC-K3-32	BC-LB-01	BC-L1-02	BC-L2-03	BC-L3-04	BC-L4-69	BC-L4-10	BC-M1-05	BC-M2-06	BC-MB-07	[illegible]
SAMPLE DEPTH	15'-25'	0-10'	0-10'	0-10'	10'-20'		5'-10'	5'-15'	5'-15'	10-20	16-26	[illegible]	[illegible]		[illegible]
DATE SAMPLED	12-17-86	12-17-86	12-16-87	1-12-87	1-22-87	12-12-86	12-12-86	12-12-86	12-12-86	12-17-86	12-17-86	12-15-86	[illegible]	1-16-86	[illegible]
1 Aluminum	3026	2522	4788	9073	10076	9307	10697	5205	7380	1120	1378	4765	1924	9385	[illegible]
2 Antimony								32							
3 Arsenic	2.0	6.0	9.0	8.0	9.0	6.0	5.0		172	33.0	60.0	3.0	2.0	6.0	
4 Barium	106	60	112	202	192	410	197	192	192	114	142	130	46	[illegible]	[illegible]
5 Beryllium															
6 Boron															
7 Cadmium		4	2	1	4			6						[illegible]	4
8 Chromium, trivalent	7	35	331	22	13		16	15	10		3	8	[illegible]	13	16
9 Cobalt	4	3	11				6	9	9			4	[illegible]	7	
10 Copper	6	83	44	39	129		12	105	141	82	101	10	[illegible]	[illegible]	[illegible]
11 Iron	3320	5409	13765	22439	26000	13046	16055	5560	11099	1500	1006	[illegible]	[illegible]	[illegible]	[illegible]
12 Lead	3.0	10.0	107.0	132.0	230.0	45.0	9.0	166	41	5.0	5.0	20	[illegible]	[illegible]	
13 Manganese	113	877	999	300	606	303	735	44	149	10	10	164	87	429	[illegible]
14 Mercury			2.2	0.4	0.2				0.1				9		[illegible]
15 Nickel	8	72	30	30	21	14	21	400	2302	83	93	11		16	[illegible]
16 Selenium															
17 Silver															
18 Thallium															
19 Tin					13										
20 Vanadium			16	29	27	22	25	10	19					21	[illegible]
21 Zinc	24	70	235	205	503	170	90	104	166	11	10	42	63	107	[illegible]
22 Cyanide			9												

CER 051767

E0007[illegible]5

9020003

APPENDIX E

SUMMARY TABLES FOR SITE-SPECIFIC
CONTAMINANT LOADING TO THE
MISSISSIPPI RIVER

Table 6.1

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW IN SITE 6

	Area (ft²)	Horizontal Flow Rate Q (ft³/day)	TOC* Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Ave. Conc. (ug/L)	Loading to River (lb/day)
January	2,630.90	-13.00	15,130.6	-3.03×10^{-2}	2,966.5	-2.56×10^{-3}	6.75	-6.10×10^{-6}	ND	--	-6.10×10^{6}	61	-7.16×10^{5}
February	2,370.00	-16.06	15,130.6	-3.00×10^{-2}	2,966.5	-3.62×10^{-3}	6.75	-6.17×10^{-6}	ND	--	-6.17×10^{-6}	61	-7.20×10^{5}
March	2,473.61	-9.08	15,130.6	-2.17×10^{-2}	2,966.5	-1.05×10^{-3}	6.75	-2.06×10^{-6}	ND	--	-2.96×10^{6}	61	5.13×10^{5}
April	2,631.51	-6.57	15,130.6	-1.44×10^{-2}	2,966.5	-1.23×10^{-3}	6.75	-1.05×10^{-6}	ND	--	-1.05×10^{6}	61	-1.41×10^{5}
May	2,652.55	-3.10	15,130.6	-6.00×10^{-3}	2,966.5	-5.96×10^{-4}	6.75	-9.44×10^{-7}	ND	--	-8.44×10^{-7}	61	-1.65×10^{5}
June	2,736.76	-6.30	15,130.6	-8.13×10^{-3}	2,966.5	-8.16×10^{-4}	6.75	-1.30×10^{-6}	ND	--	-1.30×10^{6}	61	1.17×10^{5}
July	2,767.20	-8.36	15,130.6	-1.01×10^{-2}	2,966.5	-1.96×10^{-3}	6.75	-2.45×10^{-6}	ND	--	-2.45×10^{6}	61	-4.17×10^{5}
August	2,661.00	-11.65	15,130.6	-1.96×10^{-2}	2,966.5	-3.30×10^{-3}	6.75	-4.11×10^{-6}	ND	--	-4.11×10^{6}	61	1.16×10^{5}
September	2,696.66	-17.46	15,130.6	-3.03×10^{-2}	2,966.5	-3.36×10^{-3}	6.75	-5.10×10^{-6}	ND	--	-5.10×10^{6}	61	9.86×10^{5}
October	2,630.90	-16.95	15,130.6	-2.72×10^{-2}	2,966.5	-3.16×10^{-3}	6.75	-5.03×10^{-6}	ND	--	-5.03×10^{6}	61	-6.70×10^{5}
November	2,675.61	-13.37	15,130.6	-2.73×10^{-2}	2,966.5	-2.31×10^{-3}	6.75	-5.07×10^{-6}	ND	--	-5.67×10^{6}	61	6.42×10^{5}
December	2,666.16	-11.92	15,130.6	-2.62×10^{-2}	2,966.5	-2.33×10^{-3}	6.75	-3.56×10^{-6}	ND	--	3.56×10^{-6}	61	6.10×10^{5}

* Total organic carbon.

** Polynuclear aromatics.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

CER 051769

E000727

Table 6.3

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW IN SITE 1

	Area (ft^2)	Horizontal Flow Rate @ (ft^3/day)	TOC* Ave. Conc. (mg/L)	Loading to River (lb/day)	Volatiles Ave. Conc. (mg/L)	Loading to River (lb/day)	Carcinogenic PNAs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Ave. Conc. (ug/L)	Loading to River (lb/day)
January	0.102 99	-0.442	5,716.63	-1.90×10^{-3}	1,204.5	-3.33×10^{-3}	ND	--	3.30	-9.36×10^{-6}	-9.36×10^{-6}	ND	
February	0.060 17	-0.467	5,716.63	-1.47×10^{-3}	1,204.5	-3.53×10^{-3}	ND	--	3.30	-9.87×10^{-6}	-9.87×10^{-6}	ND	
March	0.198 36	-0.346	5,716.63	-1.21×10^{-3}	1,204.5	-2.90×10^{-3}	ND	--	3.30	-7.37×10^{-6}	-7.37×10^{-6}	ND	
April	0.102 99	-0.254	5,716.63	-0.81×10^{-3}	1,204.5	-1.91×10^{-3}	ND	--	3.30	-5.37×10^{-6}	-5.37×10^{-6}	ND	
May	0.307 51	-0.110	5,716.63	-4.63×10^{-3}	1,204.5	-9.71×10^{-4}	ND	--	3.30	-2.33×10^{-6}	2.33×10^{-6}	ND	
June	0.609 62	-0.186	5,716.63	-5.90×10^{-3}	1,204.5	-1.17×10^{-3}	ND	--	3.30	-3.30×10^{-6}	-3.30×10^{-6}	ND	
July	0.013 43	-0.264	5,716.63	-0.67×10^{-3}	1,204.5	-1.90×10^{-3}	ND	--	3.30	-5.50×10^{-6}	-5.50×10^{-6}	ND	
August	0.612 86	-0.401	5,716.63	-1.55×10^{-2}	1,204.5	-3.20×10^{-3}	ND	--	3.30	-9.10×10^{-6}	-9.10×10^{-6}	ND	
September	0.305 00	-0.556	5,716.63	-3.90×10^{-2}	1,204.5	-4.10×10^{-3}	ND	--	3.30	-1.17×10^{-5}	-1.17×10^{-5}	ND	
October	0.198 36	-0.509	5,716.63	-1.97×10^{-3}	1,204.5	1.97×10^{-3}	ND	--	3.30	-1.16×10^{-5}	-1.16×10^{-5}	ND	
November	0.210 04	-0.410	5,716.63	-1.31×10^{-3}	1,204.5	-3.16×10^{-3}	ND	--	3.30	-8.87×10^{-6}	-8.61×10^{-6}	ND	
December	0.430 33	-0.333	5,716.63	-1.37×10^{-3}	1,204.5	-2.67×10^{-3}	ND	--	3.30	-7.50×10^{-6}	7.50×10^{-6}	ND	

* Total organic carbon

** Polynuclear aromatics

ND Not detected

Negative sign designates contaminant migration toward the river

Source: Ecology and Environment, Inc. 1986

CER 051770

E000728

Table E.5

CONTAMINANT LOADING TO RIVER DUE TO VERTICAL FLOW IN SITE 6

	Area (ft²)	Vertical Flow Rate Q (ft³/day)	TOCs* Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Ave. Conc. (ug/L)	Loading to River (lb/day)
January	70,751	8,670.39	35,120	19.00	2,006.5	1.61	6.75	2.57×10^{-3}	ND	--	2.57×10^{-3}	63	4.40×10^{-4}
February	70,751	8,036.04	35,120	18.34	2,006.5	1.64	6.75	2.61×10^{-3}	ND	--	2.61×10^{-3}	63	4.37×10^{-4}
March	70,751	8,026.04	35,120	18.36	2,006.5	1.64	6.75	2.61×10^{-3}	ND	--	2.61×10^{-3}	63	4.37×10^{-4}
April	70,751	5,041.03	35,120	8.43	2,006.5	0.72	6.75	1.16×10^{-3}	ND	--	1.16×10^{-3}	63	1.99×10^{-4}
May	70,751	7,707.60	35,120	17.06	2,006.5	1.65	6.75	2.31×10^{-3}	ND	-	2.31×10^{-3}	63	4.01×10^{-4}
June	70,751	8,026.04	35,120	18.34	2,006.5	1.64	6.75	2.61×10^{-3}	ND	--	2.61×10^{-3}	63	4.37×10^{-4}
July	70,751	8,306.06	35,120	18.30	2,006.5	1.55	6.75	2.46×10^{-3}	ND	--	2.46×10^{-3}	63	4.30×10^{-4}
August	70,751	6,200.15	35,120	13.45	2,006.5	1.14	6.75	1.85×10^{-3}	ND	--	1.85×10^{-3}	63	3.23×10^{-4}
September	70,751	5,101.70	35,120	11.37	2,006.5	0.97	6.75	1.56×10^{-3}	ND	--	1.56×10^{-3}	63	2.60×10^{-4}
October	70,751	6,700.33	35,120	14.79	2,006.5	1.30	6.75	2.00×10^{-3}	ND	--	2.00×10^{-3}	63	3.49×10^{-4}
November	70,751	8,026.04	35,120	18.34	2,006.5	1.64	6.75	2.61×10^{-3}	ND	--	2.61×10^{-3}	63	4.37×10^{-4}
December	70,751	9,303.23	35,120	20.63	2,006.5	1.76	6.75	2.73×10^{-3}	ND	--	2.73×10^{-3}	63	4.84×10^{-4}

* Total organic carbon.

** Polynuclear aromatics.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988

CER 051771

E000729

Table 6.7

CONTAMINANT LOADING TO RIVER DUE TO VERTICAL FLOW IN SITE 1

	Area (ft^2)	Vertical Flow Rate Q (ft^3/day)	TOC* Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PAHs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PAHs** Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PAHs** Loading to River (lb/day)	Total PCBs Ave. Conc. (ug/L)	Loading to River (lb/day)
January	166,661	10,190.60	5,736.6	6.51	1,304.5	1.37	ND	--	3.30	3.06×10^{3}	3.06×10^{3}	ND	
February	166,661	10,369.30	5,736.6	6.69	1,304.5	1.65	ND	--	3.30	4.06×10^{3}	4.06×10^{3}	ND	
March	166,661	10,369.30	5,736.6	6.69	1,304.5	1.65	ND	--	3.30	4.06×10^{-3}	4.06×10^{3}	ND	
April	166,661	7,600.65	5,736.6	3.72	1,304.5	0.97	ND	--	3.30	1.60×10^{3}	1.6×10^{3}	ND	
May	166,661	14,007.15	5,736.6	5.36	1,304.5	1.43	ND	--	3.30	3.16×10^{3}	3.16×10^{3}	ND	
June	166,661	10,190.60	5,736.6	6.51	1,304.5	1.37	ND	--	3.30	3.06×10^{-3}	3.06×10^{3}	ND	
July	166,661	13,130.13	5,736.6	6.13	1,304.5	1.39	ND	--	3.30	3.61×10^{-3}	3.61×10^{3}	ND	
August	166,661	14,007.15	5,736.6	5.36	1,304.5	1.43	ND	--	3.30	3.16×10^{3}	3.16×10^{3}	ND	
September	166,661	11,916.64	5,736.6	4.90	1,304.5	1.03	ND	--	3.30	2.93×10^{3}	2.93×10^{3}	ND	
October	166,661	14,007.15	5,736.6	5.36	1,304.5	1.43	ND	--	3.30	3.16×10^{-3}	3.16×10^{3}	ND	
November	166,661	10,190.60	5,736.6	6.51	1,304.5	1.37	ND	--	3.30	3.06×10^{-3}	3.06×10^{3}	ND	
December	166,661	10,369.30	5,736.6	6.69	1,304.5	1.65	ND	--	3.30	4.06×10^{3}	4.06×10^{3}	ND	

* Total organic carbon.

** Polynuclear aromatics.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988

CER 051772

E000730

Table 6-9

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE D***

	Area (ft²)	Flow Rate Q (ft³/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	95,142	-789.69	133,000	-6.38	110,000	-5.03	ND	--	ND	--		ND	-
February	94,720	-633.50	133,000	-5.33	110,000	-5.00	ND	--	ND	--		ND	
March	18,360	-133.03	133,000	-1.08	110,000	-0.91	ND	--	ND	--	--	ND	--
April	103,460	390.37	133,000	3.06	110,000	2.67	ND	--	ND	--	--	ND	
May	111,033	335.50	133,000	2.77	110,000	2.40	ND	--	ND	--	-	ND	
June	111,370	-44.96	133,000	-0.37	110,000	-0.33	ND	--	ND	--		ND	-
July	107,567	-451.70	133,000	-3.75	110,000	-3.36	ND	--	ND	--	-	ND	
August	90,601	-917.16	133,000	-7.57	110,000	-6.03	ND	--	ND	--	--	ND	-
September	96,130	-1,035.41	133,000	-8.56	110,000	-7.30	ND	--	ND	--	--	ND	--
October	93,113	-875.37	133,000	-7.23	110,000	-6.01	ND	--	ND	--		ND	--
November	90,656	-310.00	133,000	-2.63	110,000	-2.17	ND	--	ND	--	--	ND	--
December	100,030	-470.13	133,000	-3.80	110,000	-3.50	ND	--	ND	--	-	ND	-

* Total Organic Carbon

** Polynuclear aromatics

*** Data from monitoring wells GG-21, GG-22, GG-23, and GG-24 were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988

E0007?1

CER 051773

Table 5-11

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE G***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	105,370	-1,360.32	215	-0.02011	130	-0.01112	ND	--	ND	--	--	ND	
February	100,001	-667.42	215	-0.0137	130	-0.00780	ND	--	ND	-	-	ND	
March	115,016	381.21	215	0.0115	130	0.00616	ND	--	ND	--		ND	
April	106,401	1,331.05	215	0.0220	130	0.01361	ND	--	ND	--		ND	
May	130,781	680.62	215	0.01307	130	0.00723	ND	--	ND	--		ND	
June	100,015	-367.55	215	-0.00503	130	-0.00317	ND	--	ND	-	-	ND	
July	120,237	-930.65	215	-0.01367	130	-0.00736	ND	--	ND	--		ND	
August	100,569	-1,630.10	215	-0.0261	130	-0.01330	ND	--	ND	-	-	ND	
September	90,150	-1,356.70	215	-0.0220	130	-0.01365	ND	--	ND	--		ND	
October	103,711	-1,130.60	215	-0.0166	130	-0.00830	ND	--	ND	--	-	ND	
November	120,390	372.31	215	0.0055	130	0.00300	ND	--	ND	--		ND	
December	121,330	-390.67	215	-0.0067	130	-0.00403	ND	--	ND	--		ND	

* Total organic carbon.

** Polynuclear aromatics.

*** Data from monitoring wells SE-09, SE-10, and SE-06 were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

CER 051774

E000732

Table E 13

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT INTERMEDIATE ZONE IN SITE D***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOC* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNA** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	107,300	-36,311	6,990	-61.70	6,660	-30.63	ND	--	ND	--	--	ND	
February	107,300	-33,494	6,990	-13.33	6,660	-6.57	ND	--	ND	--	--	ND	
March	107,300	63,466	6,990	35.13	6,660	17.33	ND	--	ND	--	--	ND	
April	107,300	70,563	6,990	30.67	6,660	19.37	ND	--	ND	--	--	ND	
May	107,300	30,046	6,990	16.90	6,660	8.34	ND	--	ND	--	--	ND	
June	107,300	-13,771	6,990	-8.90	6,660	-4.83	ND	--	ND	--	--	ND	
July	107,300	-42,003	6,990	-23.62	6,660	-11.66	ND	--	ND	--	--	ND	
August	107,300	-61,053	6,990	-46.01	6,660	-22.71	ND	--	ND	--	--	ND	
September	107,300	-65,631	6,990	-40.13	6,660	-21.76	ND	--	ND	--	--	ND	
October	107,300	-37,156	6,990	-20.00	6,660	-10.31	ND	--	ND	--	--	ND	
November	107,300	60,665	6,990	23.35	6,660	11.45	ND	--	ND	--	--	ND	
December	107,300	-31,560	6,990	-12.11	6,660	-5.90	ND	--	ND	--	--	ND	

* Total Organic Carbon

** Polynuclear Aromatics

*** Data from monitoring wells GM17D and GM18D (Geraghty & Miller 1986; 1986a) were used to calculate weighted average concentrations

ND Not Detected

Negative sign designates contaminant migration toward the river

Source: Ecology and Environment, Inc. 1988

E000733

CER 051775

APPENDIX F

TOXICITY PROFILES FOR SELECTED CONTAMINANTS OF CONCERN

ARSENIC

Environmental Chemistry and Fate

Arsenic may be released to the atmosphere as a gas or vapor; or absorbed to particulate matter and transported to other media by dry or wet deposition (ATSDR 1987a). Because trivalent arsenic may undergo oxidation in the air, atmospheric arsenic is usually a mixture of trivalent and pentavalent forms. Most airborne arsenic is usually adsorbed on small diameter particulate matter. Photolysis is not considered to be an important fate process for arsenic.

Arsenic in surface water can undergo a complex pattern of transformations: oxidation-reduction, ligand exchange, biotransformation, and precipitation and adsorption (Callahan 1979). As a consequence of these reactions, arsenic is extremely mobile in aquatic systems, and riverborne arsenic is capable of being transported great distances. Factors most strongly influencing the rates of these reactions include: Eh, Ph, metal sulfide and sulfide ion concentrations, iron concentration, presence of phosphorus minerals, temperature, salinity, and distribution and composition of biota (Callahan 1979).

Sorption onto clays, iron oxides, manganese compounds, and organic matter is an important fate in surface water, with sediment serving as a reservoir for most of the arsenic entering surface water. Sediment-bound trivalent and pentavalent arsenic, methylated by aerobic and anaerobic microorganisms, may be released back into the water column.

Soluble forms of arsenic adsorb to soil and travel with the soil matter with which they are associated. Shifts in oxidation state may occur in either direction, depending on the particular characteristics of the soil and groundwater. Volatilization of methylated arsenics from groundwater is possible.

Arsenic in soil is predominantly found in an insoluble, adsorbed form. Clay with high anion-exchange capacity strongly adsorbs pentavalent arsenic. Other important adsorption processes include complexation and chelation by organic material, iron, or calcium. Leaching of arsenic is usually important in the top 30 centimeters of soil, but may also be important at greater depth in sandy soils. Arsenate predominates in aerobic soils; arsenite in slightly reduced soils; arsine, genicity studies have reported conflicting results. Several studies have reported an increased incidence of bronchogenic carcinomas in rats exposed intratracheally to an arsenic-containing pesticide. Reasons for inconsistent carcinogenicity findings in animals may include inappropriate selection of an animal model, and use of flawed study designs. In humans, epidemiologic studies and case reports have reported that arsenic is associated with tumors of the skin, lungs, genital organs, and visual organs (EPA 1984f, EPA 1985c, ATSDR 1987a).

EPA has classified arsenic in Group A, i.e., a human carcinogen, based on extensive evidence of human carcinogenicity through inhalation and ingestion exposure (EPA 1985c).

Drinking Water Standards and Criteria

Standards. The current MCL for arsenic under the National Interim Drinking Water Regulations is 50 ug/L. The NAS Drinking Water Committee has analyzed the toxicology of arsenic (NAS 1983a). Based upon this evaluation, NAS recommended the retention of the MCL pending resolution of the question whether arsenic is an essential element in the human diet.

NAS also examined the available epidemiologic studies which were designed to investigate the relationship between arsenic exposure and skin cancer in the United States. The conclusion of the report was that these studies lacked statistical power to determine if arsenic causes skin cancer. However, the report stated that precursors of skin cancer, normally seen in cases of arsenic-induced skin cancer, were not seen in these studies.

Consistent with the NAS recommendations, EPA has proposed that the MCLG remain at the current MCL of 50 ug/L. In its determination, EPA stated that the MCL was below concentrations at which noncarcinogenic toxicity had been demonstrated and was within the concentration range which might be, based on further investigation, essential for humans (EPA 1985c).

CER 051778

Criteria. Based upon recommendations of NAS, EPA has proposed that all health advisories for arsenic be set at 50 ug/L (EPA 1985d). The EPA ambient water quality criterion for the protection of human health

BENZENE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of benzene (CAS No. 71-43-2) are summarized below (EPA 1986a).

Molecular Weight (g/mole)	78
Water Solubility (mg/L at 25°C)	1,750
Vapor Pressure (mmHg at 25°C)	95.2
Henry's Law Constant (atm-m^3/mole)	5.6×10^{-3}
Log K_{ow}	2.12
K_{oc}	83
BCF	5.2

Benzene has a high water solubility and vapor pressure. As a consequence of these two properties, benzene can be characterized as a highly mobile chemical. For benzene released to air, some rainwater washout is anticipated. After deposition in water or soil, volatilization is expected to return some portion back to the atmosphere. Based on its high Henry's Law Constant, volatilization will result in substantial loss to the atmosphere following release to water.

Due to its high water solubility and high vapor pressure, transport to sediments is not expected to be major surface water fate process.

Benzene released to soil can be transported to air via volatilization, to surface water via runoff, and to groundwater via leaching. The first two pathways predominate in surficial soil, whereas the latter pathway predominates at lower soil depths.

According to criteria developed by Kenaga (1980), benzene with a K_{oc} of 83 would be considered to be mobile in soils. Other factors

Drinking Water Standards

EPA has established a final drinking water MCL of 5 μg/L (EPA 1987a).

Cadmium is not reduced or methylated by microorganisms. However, the biological production of sulfide results in cadmium precipitation. Cadmium is strongly accumulated by all organisms, with concentrations in freshwater and marine organisms hundreds to thousands of times higher than in water being typical. Bioaccumulation of cadmium is strongly correlated with soil cation-exchange capacity (CEC), decreasing with increasing CEC. Bioconcentration in aquatic life is greatest for bottom feeders (e.g. mollusks and crustaceons), followed by fish and aquatic plants (ATSDR, 1987h). Bioaccumulation due to the use of cadmium-containing pesticides on food crops has been noted in beef and poultry.

Noncarcinogenic Effects

Acute and chronic exposure to cadmium in animals and humans results in renal dysfunction, hypertension, anemia, and altered liver microsomal activity. The kidney is considered to be the critical target organ in humans chronically exposed to cadmium by ingestion. The early clinical signs of renal injury include proteinuria, glucosuria, and amino-aciduria.

To calculate a drinking water equivalent level (DWEL), EPA used renal dysfunction as an endpoint, and the most widely accepted estimate for the critical (threshold) concentration of cadmium in the renal cortex--200 ug/g. Using a 4.5% absorption of the daily dose and 0.01% excretion in the total body burden per day, EPA calculated an LOAEL of 352 ug/day for renal effects in humans. Incorporating an uncertainty factor of 10, EPA has developed an RfD of 35 ug/day. Adjusting the RfD for consumption of 2 liters of water per day, EPA has derived a provisional DWEL of 18 ug/L (EPA 1985c).

Embryotoxic and teratogenic effects have been demonstrated in many mammalian species following parenteral administration of high doses of cadmium. In contrast, there is little evidence of these effects at lower doses by either of the more relevant inhalation or oral exposure routes (EPA 1981, ATSDR 1987h).

CER 051781

Carcinogenicity and Mutagenicity

Cadmium chloride aerosol administered by inhalation for 18 months produced lung tumors in rats. In contrast, all cancer bioassays in

CHLOROBENZENE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of chlorobenzene (CAS No. 108-90-7) are summarized below (EPA 1986a).

Molecular Weight (g/mole)	113
Water Solubility (mg/L at 25°C)	466
Vapor Pressure (mmHg at 25°C)	11.7
Henry's Law Constant (atm-m^3/mole)	3.7×10^{-3}
Log K_{ow}	2.84
K_{oc}	330
BCF	10

Chlorobenzene's moderate water solubility, vapor pressure, and Henry's Law Constant indicate that volatilization from surficial soils and surface water is a major transport pathway.

Once adsorbed on soil, the moderate solubility and K_{oc} (330) indicate that chlorobenzene will leach and be transported to groundwater. The degree and rate of leaching will depend on a variety of factors including the soil type, organic carbon content, and the presence of organic solvents in the soil. Once chlorobenzene reaches the groundwater, the K_{oc} indicates that retardation relative to the groundwater flow will occur due to partitioning and adsorption to soil particles.

Current data indicate that degradation of chlorobenzene in aquatic systems is slow (EPA 1985). The estimated BCF of 10 indicates that monochlorobenzene is only slightly bioconcentrated in aquatic life.

The lifetime HA of 600 ug/L was derived from the NOAEL used in the derivation of the longer-term HA, using an additional uncertainty factor of 10 and assuming that drinking water comprises 20% of the total daily intake.

NAS has estimated, based upon the draft NTP, that a drinking water concentration of 2.3 ug/L would correspond to an estimated one-in-a-million incremental excess lifetime cancer risk (NAS 1983).

EPA has developed an ambient water quality criterion for the protection of human health of 488 ug/L and for organoleptic (odor and taste) effects of 20 ug/L (EPA 1980a).

Noncarcinogenic Effects

In rodents subjected to acute high oral exposures, CP and DCP elicited respiratory excitation, clonic convulsions, and/or motor weakness (hypotonia). Few long-term animal studies are available. Those few that are available show reduction in hematological parameters or enzyme changes. No data were found concerning effects of CP and DCP on the developing embryo or the reproductive process.

Carcinogenicity and Mutagenicity

No data were found concerning the potential carcinogenicity of CP or DCP by the oral route. However, CP and DCP were reported to promote tumors following a single dermal application of dimethylbenzanthracene on mouse skin (Boutwell and Bosch, 1959).

CP has been shown to be mutagenic in Sprague Dawley rats fed 130 mg/kg CP every other day for one week (Chung 1978). In these rats a six-fold increased incidence of chromatid deletions (12% vs. 2% in controls) was seen. Complete inhibition of mitosis was reported in bone marrow cells taken from treated rats.

DCP, tested using the Ames *Salmonella* microsomal assay, was reported as not mutagenic with and without activation.

Consequently, whereas CP can be classified as mutagenic, there are insufficient data to evaluate the mutagenicity of DCP.

Drinking Water Standards

EPA has not issued any drinking water standards, health advisories, or other criteria for CP or DCP.

CNS depression; blood dyscrasias; and lung, kidney, and liver damage. Similar data are not available for m-dichlorobenzene (1,3-dichlorobenzene or m-DCB). However, based upon short-term assays, EPA has determined that short-term assessments developed for o-DCB should apply to m-DCB.

Carcinogenicity and Mutagenicity

The few studies available on the carcinogenic potential of the DCBs have been negative or insufficient to clearly classify any DCB isomer as carcinogenic. Preliminary results of an NTP gavage bioassay indicate that o-DCB was not carcinogenic under the conditions of the experiment. Pending receipt of the final NTP report for o-DCB, EPA has categorized o-DCB according to Agency weight-of-evidence carcinogenicity criteria in Group D, not classifiable as to human carcinogenicity (EPA 1987d). EPA has classified p-DCB in group C, limited evidence of carcinogenicity in animal studies (EPA 1987a).

In general, DCBs have shown little or no mutagenic activity in a range of bacterial systems. However, several studies with mold and plant cultures treated with DCBs have reported mutations and chromosomal alterations (EPA 1987d).

Drinking Water Standards and Criteria

EPA has established a final drinking water MCL for p-dichlorobenzene of 75 ug/l (EPA 1987a). This MCL was based on a reference dose of 0.1 mg/kg/day, an uncertainty factor of 10, allocation of 20% of total human intake from all exposure sources to drinking water and various intake and physiological assumptions. EPA is also in the process of establishing an enforceable MCL for o-DCB and p-DCB, but not m-DCB. As a first step in the process, EPA has issued a proposed MCLG for o-DCB based upon a NOAEL reported in a subchronic gavage study in mice and rats. Based upon a NOAEL of 125 mg/kg/day, an uncertainty factor of 100, and the same assumptions as for p-DCB, EPA has derived a proposed MCLG for o-DCB of 620 ug/L.

In the absence of sufficient data, EPA has not developed, and is not in the process of developing, a drinking water standard for m-DCB.

nausea, and general weakness. Effects on the liver include necrosis and epithelial cell damage, and on the kidney, degeneration of the proximal tubule (EPA 1985b)

Carcinogenicity and Mutagenicity

In a NCI bioassay, EDC administered by gavage was shown to increase the incidence of tumors in both mice and rats. Based upon these data, EPA has classified EDC according to weight-of-evidence carcinogenicity criteria in Group B_2 - probable human carcinogen (EPA 1987a).

EDC has shown to induce gene mutations in bacteria, plants, Drosophilia melanogaster, and cultured Chinese hamster ovary cells (EPA 1985i). In addition, EDC has been reported to cause meiotic chromosomal disjunction in Drosophilia. Based upon these data, EPA has determined based upon weight-of-evidence criteria that EDC is a mutagen that may have the potential for causing adverse effects in humans (EPA 1985i).

Drinking Water Standards and Criteria

Standards. In the first stage of a procedure to establish an enforceable MCL for EDC in drinking water, EPA has established a MCLG of 0. This MCLG was predicated on the EPA conclusion that no exposure to a "probable human carcinogen" is acceptable. Based upon considerations of analytical feasibility and feasibility of control, EPA has issued a MCL for EDC of 5 ug/L.

Criteria. In the absence of suitable data, EPA has not developed 1-day or 10-day HAs for EDC. EPA has, however, developed a longer-term HA based upon a NOAEL reported in a rat inhalation study. Based upon a NOAEL of 405 mg/m^3, an uncertainty factor of 100 and various intake assumptions and physiological parameters, EPA derived longer-terms HAs of 740 ug/L (10-kg child) and 2,600 ug/L (70-kg adult) (EPA 1985d). Because EDC was judged to be a probable human carcinogen, EPA did not develop a lifetime HA for noncarcinogenic effects.

EPA has not developed an ambient water quality criterion for EDC for the protection of human health.

CER 051786

E0007?4

ceiving HCB orally reported both fetotoxicity and teratogenicity (EPA 1985g). The effects noted in these studies included cleft palate, reduced fetal viability, reduced neonatal weight gain and reduced relative fetal weight (EPA 1987g).

Carcinogenicity and Mutagenicity

Lifetime animal carcinogenicity studies have revealed that HCB elicited statistically significant increased tumor incidences in rats, mice, and hamsters. Based on these data, EPA has placed HCB in its carcinogenicity category B_2 as a probable human carcinogen.

Drinking Water Standards and Criteria

EPA has not developed a drinking water standard for HCB. The EPA one-day and 10-day and longer health advisories (HAs) for a 10-kg child are each 50 ug/L. The longer-term HA is 175 ug/L for a 70-kg adult. The EPA reference concentration for a potential carcinogen risk of 1×10^{-6} is 0.02 ug/L.

EPA has concluded that all of the above effects point toward a generalized impairment of normal physiological functioning of several different organ systems as adult PbB levels exceed 30 to 40 ug/dl. Evidence of impaired heme synthesis effects in blood occur at even lower levels.

More recent research has indicated that there is a relationship between PbB levels and increases in blood pressure. Preliminary review of this work indicates a statistically significant correlation between PbB levels and diastolic blood pressure in white males, ages 40 to 50, with no threshold apparent in the range of 6 to 30 ug/dl. Of particular concern is the finding of a 2 mm Hg increase in diastolic pressure per incremental PbB level increase of 0.5 ug/dl. Possible increases in risk of more severe medical events (stroke, heart attack, death) associated with lead-induced increases in blood pressure are also estimated in one of the recently published studies.

Children represent a sensitive subpopulation with regard to lead toxicity. As with adults, lead affects many different ogan systems and biochemical/physiological processes across a wide range of exposure levels. Effective PbB levels for producing encephalopathy or death in children are lower than in adults, starting at approximately 80 to 100 ug/dl. Permanent metal retardation and other marked neurological deficits are among lasting neurological sequelae typically seen in cases of nonfatal childhood lead encephalopathy. Other overt neurological signs and symptoms of subencepthalopathic lead intoxication, such as peripheral neuropathies (functional and/or pathological changes in the peripheral nervous system), have been detected in some children at PbB levels as low as 40 to 60 ug/dl. Chronic kidney disease is not evident at PbB levels above 100 ug/dl. Moreover, colic and other overt gastrointestinal symptoms occur in children, at least down to 60 ug/dl. Rank anemia is also evident at 70 ug/dl, representing an extreme manifestation of reduced hemoglobin synthesis at PbB levels as low as 40 ug/dl. All these effects are widely accepted as adverse health effects, and are reflective of widespread marked impact of lead on the normal physiological functioning of many different organ systems (EPA 1984d, 1985c, ATSDR 1987j).

any major anomalies. There are also no reliable data pointing to adverse effects in human offspring following lead exposure to fathers.

EPA has concluded that the current collective human data regarding lead's effects on reproduction on *in utero* development are insufficient for accurate estimation of exposure-effect or no-effect levels (EPA 1984d). In the absence of sufficient data, it has been suggested that it would be prudent to avoid lead exposures resulting in PbB levels exceeding 25 to 30 ug/dl to pregnant women and women of child-bearing age in general. This conclusion was based on the known equilibration between maternal and fetal blood lead concentrations and growing evidence of deleterious effects in young children as PbB levels approach 25 to 30 ug/dl. Industrial lead exposure of men with PbB levels of 40 to 50 ug/dl also appears to result in altered testicular function.

Carcinogenicity

Several studies have reported renal tumors in Wistar rats following ingestion of high doses of a lead salt (lead acetate). Lead subacetate (another lead salt) has produced benign tumors (renal carcinomas or adenomas) in Swiss mice and seveal strains of rats, but not golden hamsters. Glimomas (CNS tumors) were also observed in many of these studies.

There have been a number of epidemiological studies which have assessed the mortality experience of lead-exposed workers. In some of the studies, no excess cancer mortality was observed. In one study, non-statistically significant excess cancer mortality of the respiratory system and cancer of the digestive organs and peritoneum was reported which on evaluation by other statistical techniques by another investigator was reported to achieve statistical significance. Another study has reported increased mortality from renal cancer among a group of lead smelting workers. However, this excess mortality, based on only six cases, did not achieve statistical significance. On review of all of these studies, EPA concluded that the absence of good lead exposure documentation made it difficult to assess the contribution of lead to the observed results.

The International Agency for Research on Cancer (IARC) has classified lead in Group 3, inadequate evidence for carcinogenicity in humans,

4-METHYL-2-PENTANONE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of 4-methyl-2-pentanone are summarized below (Verscheuren 1983).

Molecular Weight (g/mole)	100
Water Solubility (mg/L at 25°C)	19,000
Vapor Pressure (mmHg at 25°C)	6 (20°C)
Henry's Law Constant (atm-m^3/mole)	no data found
Log K_{ow}	no data found
K_{oc}	no data found
BCF	no data found

4-methyl-2-pentanone (MIBK) has a high water solubility and moderate vapor pressure. As a consequence of these two properties, benzene can be characterized as a moderately mobile chemical. For MIBK released to air, some rainwater washout is anticipated. After deposition in water or soil, volatilization is expected to return some portion back to the atmosphere.

Due to its high water solubility and moderate vapor pressure, some transport to sediments is expected.

MIBK released to soil can be transported to air via volatilization, to surface water via runoff, and to groundwater via leaching. The first two pathways predominate in surficial soil whereas the latter pathway predominates at lower soil depths.

CER 051790

Noncarcinogenic Effects

In high concentrations, MIBK produces narcosis with symptoms of headache, nausea, lightheadedness, and vomiting.

NAPHTHALENE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of naphthalene (CAS No. 91-20-3) are summarized below (EPA 1984).

Molecular Weight (g/mole)	128
Water Solubility (mg/L at 25°C)	31.7
Vapor Pressure (mmHg at 25°C)	0.082
Henry's Law Constant ($atm\text{-}m^3/mole$)	no data found
Log K_{ow}	3.37
K_{oc}	no data found
BCF	1.46

Naphthalene has a moderate water solubility and moderate vapor pressure. As a consequence of these two properties, benzene can be characterized as a moderately mobile chemical. For naphthalene release to air, some rainwater washout is anticipated. After deposition in water or soil, volatilization is expected to return some portion back to the atmosphere.

Due to its moderate water solubility and moderate vapor pressure, transport to sediments is expected to be a major surface water fate process.

Naphthalene released to soil can be transported to air via volatilization, to surface water via runoff, and to groundwater via leaching. The first two pathways predominate in surficial soil, whereas the latter pathway predominates at lower soil depths.

CER 051791

Noncarcinogenic Effects

Exposure to naphthalene by the ingestion, inhalation and dermal routes has been reported to result in intravascular hemolysis, corneal to each injection. The naphthalene also contained approximately 10% methylnaphthalene.

In a second study, Knake (1956 as reported in USEPA 1980) painted a group of mice with either benzene or a solution of coal tar naphthalene in benzene and noted an excess of lymphatic leukemia in the group treated with the napthalene/benzene solution as compared to those treated with benzene alone (4 vs. 0 cases, respectively). These results are difficult to interpret because benzene is a known animal carcinogen.

Naphthalene when combined with rat microsomal fractions has been found to be nonmutagenic in bacterial mutagenesis assays (EPA 1980).

Drinking Water Standards and Criteria

EPA has not developed any drinking water standards or health advisories or ambient water quality criteria for human health for napthalene.

Studies evaluating the effects of nickel administration on animal reproductive systems have produced varying results. Nickel is known to cross the placental barrier in animals, and some data suggest this is also true for humans. Intraperitoneal and intravenous injections of nickel compounds have produced some tetratogenic effects in animals. Increased fetal mortality and reduced fetal weights also were observed. In some studies, high dosages resulted in reduced fetal survival and decreased fetal weights in the absence of frank teratogenesis.

Feeding studies involving administration of various nickel compounds to rats are more applicable to human exposure situations. Various studies have reported a correlation between nickel concentration in food or water and reproductive performance (ATSDR, 1987b). Nickel exposure has also been reported to impair male gametogenesis in mice and rats. No adverse reproductive effects linked to nickel exposure have been reported in humans.

Carcinogenicity and Mutagenicity

The chemical form and route of exposure may be important factors in determining the carcinogenic potential of nickel. Insoluble nickel compounds (e.g., metallic nickel, nickel subsulfide, and nickel carbonyl) have been shown to produce tumors following inhalation exposure. However, multiple studies in which nickel was administered orally to rats and mice have been uniformly negative (EPA 1985c). In humans, excess respiratory cancer mortality has been demonstrated in epidemiological studies of nickel smelting and refining workers.

EPA has classified nickel in group B_2--sufficient evidence for carcinogenicity in animals, limited evidence in humans--according to guidelines for carcinogenic risk assessment (EPA, 1986b) for the inhalation route, based upon the positive animal evidence for nickel subsulfide and carbonyl compounds. However, reflecting the negative animal carcinogenicity data, the Agency has categorized nickel in Group D - inadequate evidence for the oral route of exposure.

Nickel chloride was not mutagenic, whereas nickel sulfate was found to be mutagenic in *in vitro* assays.

PENTACHLOROPHENOL (PCP)

Introduction

Commercial pentachlorophenol (PCP) is contaminanted with two chemicals - hexachlorobenzene (HCB), and hexachlorodibenzo-p-dioxin (HxCDD) which are currently categorized by EPA in its category B_2 as probable human carcinogens. Both are also potential reproductive toxins. PCP is also contaminated with polychlorinated dibenzofurans. This profile primarily addresses the toxicity of commercial PCP. The reader is referred to the profiles for HCB, HxCDD, and dibenzofurans for further information relevant to evaluating the potential toxicity of commercial PCP.

Environmental Chemistry and Fate

The relevant physical and chemical properties for pentachlorophenol (CAS No. 87-86-5) are summarized below (EPA 1986a).

Molecular Weight (g/mole)	266
Water Solubility (mg/L at 25°C)	14
Vapor Pressure (mmHg at 25°C)	1.1×10^{-4}
Henry's Law Constant (atm-m^3/mole)	2.8×10^{-6}
Log K_{ow}	5
K_{oc}	53,000
BCF	770

Pentachlorophenol (PCP) has a moderate water solubility, low vapor pressure, low Henry's Law Constant, and high K_{oc}. Based upon its K_{oc} and low vapor pressure, PCB would be strongly bound to surface soil. The K_{oc} of 53,000 indicates that leaching from soils and transport to groundwater is a slow process. PCP is resistant to biodegradation. The low Henry's Law Constant and high K_{oc} indicate that PCP will be strongly partitioned to surface water sediments. Finally, the BCF indicates served in fetuses include cleft palate, reduced fetal viability, reduced neonatal weight gain, and reduced relative neonatal weight. Based on these studies, EPA set the NOEL for HCB at 1.0 mg/kg/day (EPA 1987g).

Carcinogenicity and Mutagenicity

Pure pentachlorophenol has not been reported to be carcinogenic in a number of animal studies (EPA 1987g). It has also produced negative results in an initiation/promotion study. These results are consistent with mutagenicity studies which have primarily been negative (EPA 1987g).

However, HxCDD and HCB have both been found to be oncogenic in animal studies (EPA 1987g). The EPA estimated 95% upper bound carcinogenic potencies of 6.2×10^3 and 1.67 mg/kg/day, for HxCDD and HCB, respectively (EPA 1986a, EPA 1987g).

Drinking Water Standards and Criteria

EPA has issued no drinking water standards for PCP, HCB, or HxCDD. EPA has issued a proposed MCLG for PCP of 200 ug/L, based upon a DWEL of 1.01 mg/L, and assuming a drinking water contribution of 20% to total daily PCP intake (EPA 1985a).

EPA has developed health advisories for a 10 kg child and a 70 kg adult for PCP and HCB, but not for HxCDD. The EPA health advisory limits and reference concentrations for potential carcinogens for PCP and its major contaminants are summarized in the following table.

	One-day 10 kg	Ten-day 10 kg	Long term 10 kg	Long term 70 kg	Lifetime 70 kg	Reference Concentration*
Pentachlorophenol	1000	300	300	1050	1050	--
Hexachlorobenzene	50	50	50	175	--	0.02
HxCDD	--	--	--	--	--	--
Dibenzofurans	--	--	--	--	--	--

Source: EPA, 1986a

- No limit developed.

* Corresponding to a 1×10^{-6} cancer risk.

All concentrations in ug/L.

Noncarcinogenic Effects

Phenol is a highly toxic compound that may enter the body via skin absorption, vapor inhalation, and ingestion. Based on the available human and animal data, exposure to large doses by any route of exposure can lead to serious illness or death. Toxic doses in human and species exhibit similar symptoms: initial increases in heart rate, labored breathing, cyanosis, and pulmonary edema. The present data do not indicate that phenol to be teratogenic.

Carcinogenicity and Mutagenicity

Based upon the limited animal data, the EPA has classified phenol in category D - inadequate evidence to evaluate carcinogenicity.

The mutagenicity data are equivocal presenting on balance, equivocal evidence of mutagenicity.

Drinking Water Standards and Criteria

EPA has not classified drinking water standards or criteria for phenol.

Table 1

PHYSICAL AND CHEMICAL PROPERTIES OF PCBs*

Aroclor Designation	Molecular Weight (average)	Color	Physical State	Solubility water, mg/L	Density g/cm^3 at 25°C	Partition Coefficient Log Octanol-Water*	Vapor Pressure (mm Hg at 25°C)	Henry's Law** Constant $atm\text{-}m^3/mol$ at 25°C	Biocentration Factor***
1016	257.9	Clear	Oil	0.42	1.33	5.6	4×10^{-4}	2.9×10^{-4}	42,500
1221	200.7	Clear	Oil	0.59 (24°C)	1.15	4.7	6.7×10^{-3}	3.5×10^{-3}	
1232	232.2	Clear	Oil	Unknown	1.24	5.1	4.06×10^{-3}	Unknown	
1242	266.5	Clear	Oil	0.24	1.35	5.6	4.06×10^{-4}	5.2×10^{-4}	
1248	299.5	Clear	Oil	0.054	1.41	6.2	4.94×10^{-4}	2.8×10^{-3}	70,500
1254	328.4	Lt. Yellow	Viscous liquid	0.012	1.50	6.5	7.71×10^{-5}	2.8×10^{-3}	100,000
1260	375.7	Lt. Yellow	Sticky resin	0.0027	1.58	6.8	4.05×10^{-5}	4.6×10^{-3}	190,000

* These log Kow values represent an average value for the major components of the individual Aroclor.

** Henry's Law constants were estimated by dividing the vapor pressure by the water solubilities, and represent average values for the Aroclor mixtures as a whole (ATSDR 1987r).

*** From Lyman, Reehl, and Rosenblatt (1982).

Source: Unless otherwise specified, from ATSDR (1987l).

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stitution may, in fact, vary significantly in isomer composition. Additionally, highly toxic contaminants are often present in PCB mixtures.

In general, however, it can be concluded that short and intermediate-term studies of toxicological effects following oral administration of PCBs to animals result in a variety of physiological and morphological alterations in the liver, including: enlargement, fatty infiltration, centrilobular lesions, and effects on liver porphyrin metabolism. The major biochemical effects include induction of mixed function oxidase enzymes and modification of porphyrin metabolism. PCBs can also inhibit the immune system. Skin applications to rabbits has been shown to cause erythema, keratosis, and chloracne.

Human studies related to PCB exposures have been done on the health of occupationally exposed workers, as well as on health effects noted following two incidents in which cooking oils contaminated with PCBs were ingested. Occupationally exposed workers typically demonstrated dermal problems such as chloracne, rashes, and burning sensations. While most biochemical parameters in these studies were found to be within normal ranges, one study reported an elevation of liver enzymes in exposed workers.

The two incidents, or outbreaks, concerning the ingestion of PCB-tainted cooking oils occurred in east Asia. The first incident, designated as the "Yusho" outbreak, occurred among Japanese (Higachi, 1976; Kurotsone and Shapiro, 1984); while the second, designated "Taichung", occurred among Taiwanese (Hsu et al, 1984; Lu and Wang, 1984). Health effects observed in humans following exposure included: chloracne, increased discharge from the eyes, soreness and weakness of limbs, headaches, dizziness, and general malaise. Because the cooking oil in the Yusho study was also found to be contaminated with highly toxic polychlorinated dibenzofurans, implications cannot be limited to PCBs alone in this study.

Reproduction and Development

The range of reported effects on reproduction in animals include: a lengthening of the estrus cycle, weak estrogenic activity, fetotoxicity, fetal deaths, decreased survival of the neonate, small birth weight, and in humans, sufficient evidence in animals, and inadequate evidence of activity in short-term mutagenicity tests.

EPA's cancer assessment group has calculated a unit cancer risk of 4.34 $(mg/kg/day)^{-1}$, using the upper 95 percent value of the doses used in the positive study (Kimbrough et al 1975).

Standards and Criteria

Drinking Water

As the first stage in developing a maximum contaminant level (MCL) for PCBs in drinking water, the EPA has recently proposed an MCLG of zero. EPA will establish an MCL taking into account technological feasibility of control and analytical feasibility (EPA 1988).

Surface Water

The EPA has established ambient water quality criteria for the protection of freshwater and saltwater aquatic life of 0.014 ug/l and 0.03 ug/l, respectively. For human health, EPA has estimated the drinking water concentration corresponding to one-in-a-million cancer excess of 0.0079 ng/l.

Table 2

PHYSICAL AND CHEMICAL PROPERTIES OF SELECTED PAHs*

Chemical Name	Molecular Weight (g)	CAS No.	Vapor Pressure (mm Hg)	Water Solubility (mg/L)	Henry's Law Constant	log Kow	Koc (mL/g)	BCF (L/kg)
acenaphthene	154	83-32-9	1.55×10^{-3}	3.42	9.2×10^{-5}	4.0	4.6×10^{3}	242**
anthracine	178	120-12-7	1.95×10^{-4}	4.5×10^{-2}	1.2×10^{-3}	4.45	1.4×10^{4}	1,210**
benzo(a)anthracene	228	56-55-3	2.2×10^{-8}	5.7×10^{-3}	1.16×10^{-6}	5.6	1.38×10^{6}	11,100**
benzo(b)fluoranthene	252	205-99-2	5.0×10^{-7}	1.4×10^{-2}	1.19×10^{-3}	6.06	5.5×10^{5}	
benzo(k)fluoranthene	252	207-08-9	5.1×10^{-7}	4.3×10^{-3}	3.94×10^{-3}	6.06	5.5×10^{5}	
benzo(g,h,i)perylene	276	191-24-2	1.03×10^{-10}	7.0×10^{-4}	5.34×10^{-8}	6.51	1.6×10^{6}	68,200**
benzo(a)pyrene	252	50-32-8	5.6×10^{-9}	1.2×10^{-3}	1.55×10^{-6}	6.06	5.5×10^{6}	28,200**
chrysene	228	218-01-9	6.3×10^{-4}	1.8×10^{-3}	1.05×10^{-6}	5.61	2.0×10^{5}	11,700**
dibenzo(a,h)anthracene	278	53-70-3	1.0×10^{-10}	5.0×10^{-4}	7.33×10^{-8}	6.8	33×10^{6}	
fluoranthene	202	206-44-0	5.0×10^{-6}	2.6×10^{-1}	6.46×10^{-6}	4.9	3.8×10^{4}	2,920
fluorene	116	86-73-7	7.1×10^{-4}	1.69	6.42×10^{-5}	4.2	7.3×10^{3}	1,300***
indeno(1,2,3-cd)perylene	276	193-39-5	1.0×10^{-10}	5.3×10^{-4}	6.86×10^{-8}	6.5	1.6×10^{6}	
phenanthrene	178	85-01-8	6.8×10^{-4}	1.0	1.59×10^{-4}	4.46	1.44×10^{4}	2,630**
pyrene	202	129-00-0	2.5×10^{-6}	1.32×10^{-3}	5.4×10^{-6}	4.88	3.8×10^{4}	2,800**

* Unless otherwise footnoted, data taken from EPA (1986a).

** EPA (1984c)

*** Lyman, Reihl, and Rosenblatt (1982).

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Table 2

EPA CARCINOGENICITY CATEGORIZATION FOR ORAL AND INHALATION ROUTES OF EXPOSURE FOR THE 15 PRIORITY POLLUTANTS POLYCYCLIC AROMATIC HYDROCARBONS

Compound	EPA Carcinogenicity Classifications*	
	Inhalation	Oral
acenaphthene	D	D
anthracene	D	D
benzo(a)anthracene	B_2	B_2
benzo(b)fluoranthene	B_2	B_2
benzo(k)fluoranthene	D	D
benzo(g,h,i)perylene	D	D
benzo(a)pyrene	B_2	B_2
chrysene	B_2	B_2
dibenzo(a,h)anthracene	B_2	B_2
fluoranthene	D	D
fluorene	D	D
indeno(1,2,3-cd)perylene	C	C
naphthalene	D	D
phenanthrene	D	D
pyrene	D	D

* Unless otherwise footnoted, classification taken from EPA (1986a).

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Table 3

RELATIVE POTENCY ESTIMATES DERIVED FOR POLYCYCLIC AROMATIC HYDROCARBONS CATEGORIZED IN GROUP A, B, OR C ACCORDING TO EPA'S WEIGHT OF EVIDENCE CRITERIA

Compound	Relative Potency Estimates
benzo(a)pyrene	1
benzo(a)anthracene	0.145
benzo(b)fluoranthene	0.140
chrysene	0.0044
dibenzo(a,h)anthracene	2.82
indeno(1,2,3-cd)pyrene	0.232

Source: Thorslund et. al. (1986)

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liver and kidneys. In humans, the principal effects are CNS depression and liver toxicity.

Carcinogenicity and Mutagenicity

A 1977 NCI bioassay in which PERC was administered by gavage reported increased incidence of liver tumors in mice but not rats (EPA 1985d). A draft report of a NTP inhalation bioassay, currently under internal review, has noted an increased incidence of tumors in mice and rats. Although EPA has previously categorized tetrachloroethylene in Group B_2--probable human carcinogen (EPA 1985b, 1985h)--the Agency is awaiting final results of the NTP bioassay before commencing a rule-making for the chemical in drinking water.

PERC has been evaluated for its ability to cause gene mutation, chromosomal aberrations, unscheduled DNA synthesis, and mitotic recombination. In general, these responses have been weak and were observed at high concentrations that were cytotoxic (EPA 1985h). Additionally, no dose-dependent relationships were demonstrated in these studies (EPA 1985h).

Drinking Water Standards

EPA has not established an MCL for PERC in drinking water. The agency is scheduled to begin rule-making procedures to establish an MCL in the near future.

Carcinogenicity and Mutagenicity

Only one long-term carcinogenicity bioassay of toluene has been reported. This study concluded that toluene was not carcinogenic following inhalation in rats. NTP is conducting carcinogenicity studies in which toluene is being administered by inhalation and gavage to rats and mice. In addition, carcinogenicity studies by European investigators are expected to be published in the next few years. According to weight-of-evidence carcinogenicity criteria, EPA has classified toluene in Category D, not classifiable as to human carcinogenicity (EPA 1985c).

Toluene has not been shown to be mutagenic in *in vivo* or *in vitro* assays (EPA 1985c).

Drinking Water Standards and Criteria

Standards. In the first stage of the rule-making process designed to establish a MCL for toluene in drinking water, EPA has issued a proposed MCLG of 2,600 ug/L derived from the AADI of 10,100 ug/L by allocating a 20 percent of drinking water contribution to total intake from all sources of exposure (EPA 1985c). Subsequent to finalization of the MCLG, EPA will evaluate analytical feasibility and feasibility of control in establishing an enforceable MCL.

Criteria. In the absence of adequate dose-response data for oral exposure to toluene, EPA derived a 1-day HA, based on NOAEL of 377 mg/m^3 reported in studies of humans, the subjects of single inhalation exposures of up to 8 hours. Based upon the NOAEL, an uncertainty factor of 100, and a variety of physiological parameters and intake assumptions, EPA derived 1-day HAs of 18,000 ug/L and 63,000 ug/L for a 10-kg child and 70-kg adult, respectively (EPA 1985d).

In the absence of sufficient data, EPA derived 10-day HAs of 6,000 ug/L (child) and 21,000 ug/L (adult), by applying an uncertainty factor of 3 to the 1-day HA. The Agency utilized a three-fold rather than the usual 10-fold uncertainty factor because toluene is rapidly distributed and excreted, and because the chemical presents little bioaccumulation potential relative to typical toxicants (EPA 1985d).

The EPA ambient water quality criterion for the protection of human health is 14,300 ug/L (EPA 1980a).

EPA has developed a risk reference dose (RRfD) of 0.35 mg/kg/day based upon a NOAEL of 1,365 mg/m^3 reported in a study in which mice were exposed by inhalation for 14 weeks. EPA derived the RRfD by application of an uncertainty factor of 100, a 30% absorbed dose, and standard physiological parameters (EPA 1985g).

Carcinogenicity and Mutagenicity

There have been two TCA carcinogenicity bioassays. The first, conducted by NCI, was judged to be inadequate due to poor survival in treated animals. Preliminary results of the second, by NTP, showed elevated incidences of hepatocellular carcinomas. These initial results have been questioned and the study is currently being audited (EPA 1985b). Based upon these results, EPA has classified TCA according to weight-of-evidence criteria in Group D, not classifiable--inadequate human and animal evidence of carcinogenicity (EPA 1987a).

Drinking Water Standards and Criteria

Standards. EPA has established a drinking water MCL for TCA of 200 ug/L.

Criteria. EPA has developed a 1-day HA based upon a LOEL of 1.4 g/kg/day reported in a study of rats receiving a single oral dose of TCA. Based upon the LOEL, and standard weight and intake assumptions, EPA derived a 1-day HA of 14,000 ug/L for a 10-kg child (EPA 1984d). In the absence of sufficient data, EPA has not developed a 10-day HA. EPA has developed longer-term HAs of 35,000 ug/L (child) and 125,000 ug/L (adult), based upon a NOAEL of 0.5 g/kg/day reported in a study in rats receiving TCA by gavage for 12 weeks (EPA 1985d).

The EPA lifetime HA of 200 ug/L is equivalent to and was derived by the same methodology as the RMCL (EPA 1985d).

The EPA ambient water quality criterion for TCA for the protection of human health is 18,700 ug/L (EPA 1980a).

Carcinogenicity and Mutagenicity

Six studies of the carcinogenicity of TCE in animals have been published. Two have reported significant increases in liver tumors in mice. EPA has judged three others as technically flawed. A sixth reported that TCE, containing epichlorohydrin and epoxybutane, was carcinogenic in a less responsive mouse strain, but pure TCE was not (EPA 1985b). Recognizing the lower responsiveness of the mice in the latter study, EPA has classified TCE based upon weight-of-evidence carciongenicity guidelines in Category B2--probable human carcinogen (EPA 1987a).

Commercial TCE containing stabilizers has been reported to be weakly mutagenic in a variety of *in vitro* and *in vivo* assays representing a wide evolutionary range of organisms (EPA 1985g). Based on these data, EPA has concluded that commercial TCE may have the potential to cause weak or borderline increases above the spontaneous level of mutagenic effects in exposed human tissues (EPA 1985g).

Drinking Water Standards

EPA has established a drinking water MCL for TCE of 5 ug/l (EPA 1987a).

ug/g and mice receiving 14,700 ug/g. Assuming that rats weighed 0.4 kg and consumed 0.02 kg/day, NAS estimated a minimum toxic dose of 500 mg/kg/day (NAS 1982).

Carcinogenicity and Mutagenicity

Technical grade TCP was administered in the diet to male and female F344 rats and male $B_6C_3F_1$ mice at concentrations of 5,000 ug/g and 10,000 ug/g, respectively, for 105 to 107 weeks (NCI 1979 as cited in NAS 1982). Female $B_6C_3F_1$ mice received TCP at 10,000 ug/g to 20,000 ug/g, but at 38 weeks, the doses were reduced by a factor of 4 because of reduced weight gain. Under the conditions of the experiment, TCP was reported to be carcinogenic in male F344 rats (lymphomas or leukemias) and $B_6C_3F_1$ mice (hepatocellular carcinomas or adenomas) (NAS 1982). Polychlorinated dibenzofurans and dioxins may be formed during the chemical synthesis of TCP. The dioxin content of the technical grade TCP used in these studies was not reported.

Based upon the positive animal studies, EPA has categorized TCP as a B_2, probable human carcinogen (EPA 1986a).

TCP was not reported as mutagenic in the Ames assay with or without activation by hepatic microsomes (EPA 1984c). TCP did increase the mutation rate but not the intragenic recombination in S. cervisiac (EPA 1984c).

Drinking Water Standards and Criteria

EPA has not developed drinking water standards or health advisories for TCP. EPA has established ambient water quality criteria (AWQC), based upon TCPs carcinogenicity in animals, for the protection of human health. The AWQC criteria are 1.2 ug/L for water and fish consumption, and 3.6 ug/L for fish consumption only. These criteria are equivalent to the estimated incremental increased 1 x 10^{-6} lifetime cancer risk, based upon the animal carcinogenicity study results (EPA 1986g).

REGION V

I-103-07

DATE: July 26, 1982

SUBJECT: June 3, 1982 Trip Report to Dead Creek Sauget, Illinois

St Clair Co
Cahokia/Dead Creek

FROM: Michael C. O'Toole Michael C O'Toole

TO: File

On June 3, 1982 at 9:00 a.m., I met Tom Powell of the Illinois Environmental Protection Agency (IEPA) at their office in Collinsville, Illinois. Tom drove me to the Dead Creek site in Cahokia, Illinois. My objective was to determine if personal safety equipment would be required for any contactor installing a chain link fence around the perimeter of the site.

Tom and I arrived at the site around 10:00 a.m. The weather was sunny warm and humid and the termperature was approximately 85°F. The creek bed is approximately 10 feet below the bottom of the existing fence. There was water in the creek but it appeared to be stagnant. Tom remarked that he had never seen that much water in the creek. The existing fence (see photographs) was down in several areas and in one location was being held down with rocks. The existing fence was in definite need of replacement.

I decided that it would be necessary to dig a hole every forty paces as close to the existing fence as possible. Tom and I would then use the HNU Photoionizer to determine if any contaminants gases were emanating from the holes. Tom and I dug 42 holes (see attached map) approximately 18-24 inches deep and 9 inches in diameter. Holes numbers 31, 32, 34 and 35 were the only ones that the HNU readout was greater than the 2 ppm background. The readings for those holes was approximately 4 ppm. Tom was surprised that those holes showed greater than background levels. Tom conducted most of the early investigations at the Dead Creek site and he was very familiar with the locations of the heavy contamination discovered by IEPA.

Tom and I decided that the readings from those four holes could be discounted because they were not significantly higher than background. In addition those readings were probably associated with the farming activities at that portion of the site. A soybean crop had just been planted.

Based on this field trip I decided that no personal safety equipment would be required to install the fence.

cc: Tom Powell, IEPA ✓

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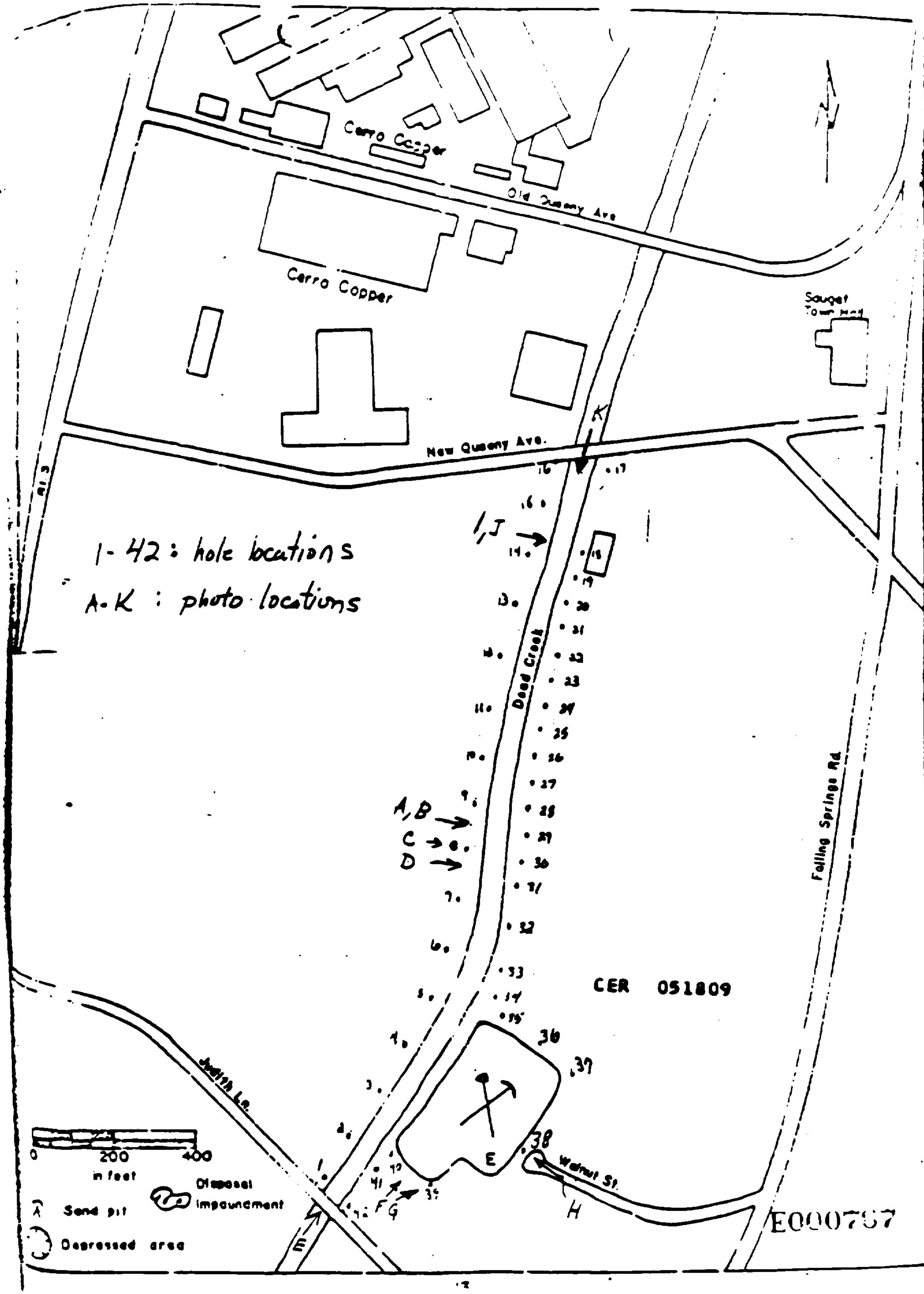

Cerro Copper
Old Queeny Ave
Cerro Copper
Sauget Town Hall
New Queeny Ave.
Rt 3
Dead Creek
Falling Springs Rd.
Judith Ln.
Walnut St.
1-42 : hole locations
A-K : photo locations
0 200 400
in feet
Disposal impoundment
Sand pit
Depressed area

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY **MEMORANDUM**

TO: Division File DATE: [illegible]

FROM: J.P. Evans ☑ Information only

SUBJECT: General - St Clair Co. [illegible] Dead Creek ☐ Response requested

On Friday, Sept 17, 1982 an inspection was made of the Dead Creek area to determine the status of the construction of the fence. At the time of the inspection there was no activity. The status of the fence as contracted is as follows: Posts have been installed on the entire west edge of the creek, but no fencing. The north edge has both posts and fencing. The East side has posts and fencing up to the private home located in the southeast corner of the creek. Snow fence is still in place from the property surrounding the private home, and along the south edge of the creek.

CER 051810

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EPA-90A (6/79-10M) GR-81A

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

MEMORANDUM

TO: Division File

DATE: 10-27-82

FROM: [illegible] Powell - Southern

☒ Information only

SUBJECT: General St Clair Co Cahokia / Dead Creek

☐ Response requested

On October 27, 1982 this writer visited the subject site, along with Mike O'Toole: USEPA Superfund Region V, for the purpose of inspecting the completed fence for final payment. Mr O'Toole was responsible for inspecting the completed fence to make sure it conform to the contract specifications, after this determination is made only then could final payment be made. Upon arrival at the site, this writer met with Mr O'Toole and Ed Gentry - Granite City Fence. While walking on the east side, just north of the pond it was apparent that someone had tried to steal portions of the fence. Two corner braces were missing, the barbed wire cut and the fabric cut from the fence posts. Except for this act of vandalism, the fence met the contractual specifications, and according to Mr O'Toole final payment will be made. While still present at the site crews from Granite City Fence were ~~[illegible]~~ repairing the damage. As of this visit, all work has been completed except for the top strand of barbed wire on portions of the western side. After leaving the site, this writer stopped at the Cahokia Police Depart to report that vandalism had occurred to the fence, and to ask their assistance to control any future vandalism acts. Note - Granite City Fence has still not supplied a padlock per the contract - Ed Gentry said that a padlock will be supplied in a day or two.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

MEMORANDUM

TO: Division File

DATE: 10/29/82

FROM: Tom Powell - southern region

☒ Information only

SUBJECT: General St. Clair Co. Cahokia/Dead Creek

☐ Response requested

On October 28, 1982 this writer traveled to the subject site along with Doug Tolan and Ken Crowe of our Springfield office. Messrs. Tolan & Crowe came down to inspect the finished fence at Dead Creek as well as to make a determination how to transport the old snow fence back to Springfield. Mr. Tolan said that he would be in contact with Bob Robinson (618-337-5810) of the Village of Cahokia to set up times, dates, etc. for the pick-up of the fence which is at present stored at the Cahokia Municipal garage.

CER 051812

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EPA-90A (6/75-10M) GR-91A

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January 6, 1983

Division File

Tom Powell TEP - Southern Region

LPC - General - St. Clair County - Cahokia/Dead Creek

This office has received reports that recent heavy rainfalls have had an impact on Dead Creek. The amount of water within the creek is as high as this writer has seen since the Agency became aware of the situation in the spring of 1980.

On January 4, 1983, Tony Townsen, the Health and Safety Officer of Cahokia, contacted this office to say that water is flowing through the blocked culvert under Judith Street. Officer Townsen was concerned that water from the contaminated portions of the creek would wash contaminants downstream. Officer Townsen was told that there is little that the Agency could do to correct the situation as it now exists, but that the Agency could sample the water as it flows under Judith to see if there is a problem.

On January 5, 1983, this office received a call from Nancy Batson, 102 Walnut St., Cahokia, 618/337-4089. Mrs. Batson lives next to the borrow pit that is adjacent to Dead Creek. She stated that water is flowing into her basement at an alarming rate and that a sump pump must be operated 24 hours a day. She wondered that if perhaps some of this water could be contaminated, since a strange faint odor is noticeable at times. After a short discussion within this office, this writer contacted Mrs. Batson to say that someone would be out, later in the day, to sample the water in her basement.

This writer arrived in the area at approximately 3:00 p.m. that afternoon. A water sample was then obtained from the south side of Judith, where the blocked culvert discharged. The water level on the south side was above the culvert. Subsequently, it was impossible to estimate the flow rate. A water sample was collected, however, near an eddy on the south side. (See lab sheets) The freeboard on the north side of Judith was approximately 4-5 feet, so the likelyhood of the water running over Judith was remote. After obtaining this sample, this writer proceeded to the Batson residence to obtain a water sample from the basement. As stated previously, water was entering the basement at a substantial rate. Mrs. Batson was told that after results are received from the lab she would be notified. With the samples in hand, this writer left the site.

TEP:jlr

cc: Southern Region

CER 051813

E000771

Illinois Environmental Protection Agency

EPA NEWS

2200 Churchill Road, Springfield, Illinois 62706 217/782-5562

For Immediate Release

Contact: John Muraro

SPRINGFIELD, ILLINOIS, SEPTEMBER 24, 1980

The Illinois Environmental Protection Agency's involvement in Cahokia's Burning Ditch (Dead Creek) was slow in developing. The Agency received initial reports from area residents in May of periodic smoldering of materials in the ditch between Queeny Avenue and Judith Lane. At that time the incident did not appear to be of a serious nature, and the Agency assigned it a low priority.

That all changed on August 27 when it was learned that Peter Laumann's dog rolled in the ditch and died of apparent chemical burns. Preliminary samples taken in the ditch revealed hazardous levels of phosphorous, heavy metals and PCB's along the half-mile of ditch between the two streets.

Subsequent soil samples ~~taken on September 16 and 17 of soil in~~ the ditch substantiated earlier results, (see attached table). At that time water samples were taken from three private wells plus a pond adjacent and connected to the ditch.

Samples from the wells were analysed and showed normal levels of metals. Analysis of the same wells for organic chemicals were negative for two but the well at 101 Walnut Street adjacent to the pond showed low levels of chlordane, PCB's and alkylbenzenes.

Analysis of the pond water showed normal levels of metals with low levels of PCB's and aliphatic hydrocarbons which are petroleum products such as motor oil.

CER 051814

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Based on the initial samples the Agency moved to seal off the ditch between the roads. Fencing and signs warning the public were placed at each end of the ditch. On September 17 the Illinois Department of Transportation, District 8, began installing a snow fence along both sides of the ditch and around the pond, sealing off the contaminated area to unauthorized personnel. This installation involved 7,000 feet of fencing from DOT stocks and was under the supervision of Dale Klohr, the district engineer. Cost of the fence is estimated at $7,500 and will be paid for by the Illinois Emergency Services and Disaster Agency from the Governor's Disaster Relief Fund. Tests taken by the Illinois Department of Public Health show no radioactivity in the area.

These actions complete the first phase of dealing with this situation aimed primarily at safeguarding the public's health and safety.

Phase two will concern itself with the long-term environmental impact of the contamination, its extent and assessment of the liability and responsibility for the situation.

Phase three will address the problem of cleanup and disposal.

At this time the Agency feels there is no threat from the ditch to the health and safety of the public. There are no vapors from the contamination unless the ground in the bed of the ditch is disturbed. These will be sampled later this week for laboratory analysis to determine their content.

With the public safety issue winding down the Emergency Response Unit will turn over future action by the Agency to the Division of Land Pollution Control as provided for in IEPA operating procedures. This division will develop a program to determine the extent of the pollution in the affected area as well as north and south of the area of immediate concern.

Its primary objective will be to establish the exact perimeter of the contamination by a sampling program that includes:

CER 051815

E000773

1. east and west of the ditch from Queeny Avenue to Judith Lane.
2. north and south of that area from Queeny to beyond the industrial complex and from Judith to the Mississippi River as well as both sides.
3. testing vegatation along both sides of Dead Creek along the area outlined plus take samples of crops in the immediate vicinity.
4. core sampling along the same route to determine the extent, if any, of groundwater contamination.

Land personnel will also pursue reports that a buried dump exists on a three-acre site 300 yards south of Sauget Village Hall in an area bounded by Queeny Avenue, Falling Springs Road and the northern boundary of the old Waggoner Trucking Company property.

This phase of the Agency's actions will extend over a period of several months. Unfortunately there are no quick solutions to solving problems such as those that have been found here. It will take time for these actions as well as establishing who is responsible and liable for creating this situation.

RFP No. WA 82 - H099

Exhibit A
July 8,1982
Page 1 of 3 pages

Specifications and Statement of Work

Background

Dead Creek is located in the towns of Sauget and Cahokia in St. Clair County, Illinois. The creek supplies drainage for part of the Mississippi River flood plain known as the American Bottoms. During the past forty years Dead Creek has received industrial wastes from a variety of industries including the Harold Waggoner Trucking Company, Monsanto Corporation, Midwest Rubber Reclaiming Company, Chemical Warfare Service Division of the U.S. Army, Lewin Metals Company (now the Cerro Coopper Company), American Zinc (now AMAX Zinc), LuBright Refinery (now a Mobil Oil Marketing Terminal) and Empire Disposal. A majority of these discharges were eliminated prior to 1971 when a culvert under New Queeny Avenue was plugged. These industrial wastes are now discharged to the Sauget Wastewater Treatment plant.

The creek was blocked at Judith Lane which prevented contaminated waters fom being transported downstream. Concentration of several metals including barium, copper, lead, nickel, phosphorous and zinc exceeded several thousand parts per million (ppm). Polychlorinated biphenyls (10000 ppm), dichlorobenzene (12000 ppm), xylene (540 ppm), trichlorobenzene (3700 ppm), chloronitrobenzene (240 ppm), biphenyl (9000 ppm), dichlorophenol (170 ppm), alkylbenzenes (370 ppm), naphthalenes (650 ppm), and hydrocarbons (21000 ppm) were also identified in a few of the samples.

Scope of Work

The Contractor shall furnish the necessary personnel, materials, services, facilities (except as otherwise specified herein), and otherwise do all things necessary or incident to the performance of the work as set forth below:

Products

a) Fence - Chain link wire fabric shall be made of No. 9 gauge galvanized steel wire, woven in a 2 inch mesh. Top and bottom edges shall be twisted and barbed. The fabric will be one piece with a width of 72 inches. 7 6

b) Barbed Wire - Galvanized steel wire shall consist of two strands of No. 12 1/2 gauge steel wire with four point barbs on five inch centers.

c) Posts and Bracing - Pipe line posts shall be 2" OD galvanized steel pipe. Schedule 40 pipe /

Corner and gate posts shall be 3" OD galvanized steel pipe.

Bracing and top rail shall be 1 - 5/8" OD galvanized steel pipe.

CER 051817

E000775

IL-[illegible]

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY Sample #20

SPECIAL ANALYSIS FORM

D022315

Time Collected 2 45 p | Sub-Basin [illegible]

Date Collected 9-1-81 | Collector [illegible]

Facility Name: | Facility Number: | File Town [illegible]

Stream Name(s) Dead Creek | Stream Code:

Source of Sample: (Exact Location)

Water pooled near catch basin on North side of Queeny Ave. & directly across from Dead Cr.

Physical Observations, Remarks: Approx. 2-2½" rain in previous 24 hrs. water fairly clear w slight oil sheen. → TEST FOR PCB, phthalates, and aromatic & halogenated hydrocarbons

Flow	Field Dissolved Oxygen	Field pH	Field Temp.

____ Arsenic	____ Coliform/100ml	____ BOD
____ Barium	____ Fecal Coliform 100 ml	____ COD
____ Boron	____ Fecal Strep 100 ml	____ TS/EC
____ Cadmium	____ Algae (Total) /ml	____ Susp. Solids
____ Copper	____ Ammonia (N)	____ Vol. Susp. Solids
____ Chromium (tri)	____ Organic Nitrogen (N)	____ pH (units)
____ Chromium (hex)	____ Nitrate + Nitrite (N)	____ Turbidity (JTU)
____ Iron (Total)	____ Phosphorus (P)	____ Hardness
____ Iron (Dissolved)	____ Chloride	____ Alkalinity
____ Lead	____ Fluoride	____ Total Acidity
____ Manganese	____ Sulfate	____ Free Acidity
____ Mercury (ppb)	____ Cyanide	PCBs = 0.63 ug/l Oil
____ Nickel	____ MBAS	____ Other (Specify)
____ Selenium	____ Phenol (ppb)	
____ Silver		
____ Zinc		

Other organic compounds not detected in the extract of this sample by gc/mass spectrometry

RECEIVED
Ill. Environmental Protection Agency
JAN 20 1982
Division of Water Pollution Control
Field Operations Section — Reg. VI

Results in mg/l unless otherwise noted. KM

100% Recycled Paper
IL532-0546
LABS 9 3/73 PCM

Transported by: [illegible]
Received by:
Transported by:
Received by: CER 051818

D022315 LAB USE ONLY
Lab Number: ____ Rec'd by: [illegible]
Date sample rec'd: 9/2/81 Time:
Date analysis completed:
Date results forwarded: 1/14/82
Total Tests requested: ____ Tests run: ____
Lab Section: [illegible] Supervisor: [illegible]

E000776

CER 051819

E000777

C

DEAD CREEK

WELL # G-109, ABOUT 450' S

OF QUARRY AND 10 FT. E

DEAD CREEK, SAMPLED 1-28-81.

PPM — STD OR NORMAL

0-3

B 17

AMMONIA - 75 .005-1

ARSENIC - 390 0-50

BOD - 1315 10-50

COD - 941 1.0

COPPER - 2144 500-1000

HARDNESS - 198 2

IRON - 184 5-100

MAGNESIUM - 176 1.0

NICKEL - 41 6.8-7.2

pH - 3.7 1-5

PHOSPHORUS - 10 1.0

ZINC -

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only) ______

L P C S M 0 1 0 (1)–(8) SITE INVENTORY NUMBER Several (9)–(16)

MONITOR POINT NUMBER G 10 L (17)–(20) DATE COLLECTED 012881 (21)–(26)

St Clair Co. - LPC REGION 5 (27)

Cahokia (Location) / Dead Creek (Responsible Party)

Legal (1); Illegal (2); Indicate One: 1 (28) Board Order (X) (29)

Time Collected 11:55 a.m./p.m. Unable to collect sample (X) (30)

Stick-up 0.7 ft. (31)(33) Depth to water 9.6 ft. (from T.O.C.) (34)(36)

Sample temp. (37) ° (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 1 (41)

Sample Appearance: slightly turbid; odorless

Collector comments: fast recharge

R.C. Munn + T. Powell — Collected by — LPC — Div. or Company

R.C. Munn — Transported by — LPC — Div. or Company

LAB USE ONLY
Lab No. B 36386
Date Rec'd JAN 29 1981
Rec'd by [illegible] Time 4:00 a.m./p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed ______
Date forwarded ______

Supervisor Signature

Name ______
Address of Lab ______

LPCSM020
Lab Comments:
(27) — — — (36)
(37) — — — (46)
(47) — — — (56)
(57) — — — (66)
(67) — — — (76)
Private Lab (X) (77)
IEPA Lab (X) (78)

* Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

4/11

LPCSM030

		Parameter	Value
27	X	Alkalinity[1]	[illegible]
31	X	Ammonia as N	[illegible]
37	X	Arsenic As	0.015
44	X	Barium Ba	0.9
49	X	BOD	1
53	X	Boron B	2
58	X	Cadmium Cd	0.00
64	X	Calcium Ca	220.0
69	X	COD	45
73	X	Chloride Cl	20

LPCSM040

		Parameter	Value
27	X	Chromium Cr (tot)	0.02
33		Chromium Cr^{+6}	
39	X	Copper Cu	0.59
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	•	Fluoride F	
61	X	Hardness $CaCO_3$	554
65	X	Iron Fe	30.4
70	X	Lead Pb	0.17

LPCSM050

		Parameter	Value
27	X	Magnesium Mg	48.2
32	X	Manganese Mn	3.02
38	X	Mercury Hg	0.000
45	X	Nickel Ni	0.1
51	X	Nitrate-nitrite N	0.0
56		Oil and Grease	
60	X	pH (Units)	7.0
63	X	Phenolics	0.000
70	X	Phosphorus P	0.91
75	X	Potassium K	6.4

LPCSM060

		Parameter	Value
27	X	R.O.E. (180°C)	
31		Selenium Se	0.002
36	X	Silver Ag	0.00
44	X	Sodium Na	13
49		SC (umhos/cm)	
53	X	Sulfate SO_4	129
58	X	Zinc Zn	0.3
63		___	

CER 051821

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000779

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only)

L P G S M 0 1 0 (1) (8) SITE INVENTORY NUMBER (9) General (16)

MONITOR POINT NUMBER (17) G102 (20) DATE COLLECTED (21) 012881 (26)

St. Clair Co. - LPC REGION (27) 5

Cahokia (Location) / Dead Creek (Responsible Party)

Legal (1); Illegal (2); Indicate One: (28) 1 Board Order (X) (29)

Time Collected 11:20 a.m. p.m. Unable to collect sample (X) (30)

Stick-up (31) 2.0 (33) ft. Depth to water (from T.O.C.) (34) 16.8 (36) ft.

Sample temp. (37) ° (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) (41) 1

Sample Appearance: turbid; odorless

Collector comments: Fast recharge

P.C. Menn + T. Powell LPC
Collected by Div. or Company

P.C. Menn LPC
Transported by Div. or Company

LAB USE ONLY
Lab No. 36387
Date Rec'd JAN 29 1981
Rec'd by [illegible] Time 9:00 a.m. p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded

Supervisor Signature

Name
Address of Lab

LPCSM020
Lab Comments:

(27) - - - - - - - - (36)
(37) - - - - - - - - (46)
(47) - - - - - - - - (56)
(57) - - - - - - - - (66)
(67) - - - - - - - - (76)

Private Lab (X) (77)
IEPA Lab (X) (78)

LPCSM030

		Parameter*	Value
27	X	[illegible]	32 [illegible]
31	X	Ammonia as N	2.0 [illegible]
37	X	Arsenic As	0.016
44	X	Barium Ba	1.22 [illegible]
49	X	BOD [illegible]	3 [illegible]
53	X	Boron B	2.7 X X
58	X	Cadmium Cd	0.00 X X
64	X	Calcium Ca	328.9 [illegible]
69	X	COD	93 X X X X
73	X	Chloride Cl	22 X X X X

LPCSM040

27	X	Chromium Cr (tot)	0.02 X X
33		Chromium Cr^{+6}	. X X
39	X	Copper Cu	0.29 X X
45	X	Cyanide CN	0.00 X
52		Fecal Coli	X X X X
56		Fluoride F	. X X X
61	X	Hardness $CaCO_3$	1072 X X X X
65	X	Iron Fe	16.5 X X X
70	X	Lead Pb	0.02 X X

LPCSM050

27	X	Magnesium Mg	78.0 X X
32	X	Manganese Mn	3.12 X X
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.1 X X X
51	X	Nitrate-nitrite N	2.5 X X X
56		Oil and Grease	X X X X
60	X	pH (Units)	X X 7.0 X X X
63	X	Phenolics	0.000 X
70	X	Phosphorus P	0.55 X X
75	X	Potassium K	12. X X X

LPCSM060

27	X	R.O.E. (180°C)	X X X X
31		Selenium Se	0.002 X
36	X	Silver Ag	0.00 X X
44	X	Sodium Na	63. X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO_4	523. X X X
58	X	Zinc Zn	1.2 X X X
63			

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

CER 051822

[1]Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

(HIAI)

E000750

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(Y) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only)

L P C S M 0 1 0 (1)(8) SITE INVENTORY NUMBER General (9)(16)

Point 6103 (17)(20) DATE COLLECTED 012881 (21)(26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

(1): Illegal (2): Indicate One: 1 (28) Board Order (X) (29)

Collected 11:10 a.m. p.m. Unable to collect sample (X) (30)

Stick-up 00.0 ft. (31)(33) Depth to water 15.0 ft. (from T.O.C.) (34)(36)

Sample temp. ° (37)(39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 1 (41)

Sample Appearance: slightly turbid, odorless

Collector comments: fast recharge; casing broken at 6E.

R. C. Menn + T. Powell LPC
Collected by Div. or Company

R. C. Menn LPC
Transported by Div. or Company

LAB USE ONLY	
Lab No.	B 36388
Date Rec'd	JAN 29 1981
Rec'd by	[illegible] Time [illegible] a.m. p.m.
Sample temp. acceptable	YES NO
Sample properly preserved	YES NO
Date completed	
Date forwarded	
Supervisor Signature	
Name Address of Lab	

LPCSM020
Lab Comments:

(27) ——————— (36)

(37) ——————— (46)

(47) ——————— (56)

(57) ——————— (66)

(67) ——————— (76)

Private Lab (X) (77)
IEPA Lab (X) (78)

Col.		Parameter	Value
27	X	Alkalinity[1]	322
31	X	Ammonia as N	[illegible]
37	X	Arsenic As	0.018
44	X	Barium Ba	2.9
49	X	BOD	0
53	X	Boron B	2.4
58	X	Cadmium Cd	0.00
64	X	Calcium Ca	176.3
69	X	COD	56
73	X	Chloride Cl	64

Col.		Parameter	Value
27	X	Chromium Cr (tot)	0.025
33		Chromium Cr+6	
39	X	Copper Cu	0.36
45	X	Cyanide CN	0.00
52		Fecal Coli	
56		Fluoride F	490
61	X	Hardness CaCO3	
65	X	Iron Fe	20.8
70	X	Lead Pb	0.00

Col.		Parameter	Value
27	X	Magnesium Mg	46.3
32	X	Manganese Mn	5.0
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.4
51	X	Nitrate-nitrite N	0.1
56		Oil and Grease	
60	X	pH (Units)	7.1
63	X	Phenolics	0.010
70	X	Phosphorus P	2.1
75	X	Potassium K	9.8

Col.		Parameter	Value
27	X	R.O.E. (180°C)	
31		Selenium Se	0.002
36	X	Silver Ag	0.00
44	X	Sodium Na	78
49		SC (umhos/cm)	
53	X	Sulfate SO_4	256
58	X	Zinc Zn	1.9
63			

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

(4111)

CER 051823

E000781

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(Y) Sample
(1) Upstream	(1) Monitor Well	(1) Flow or Seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Pile
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only)

(1) L P C S M 0 1 0 (8)   SITE INVENTORY NUMBER (9) General (16)

MONITOR POINT NUMBER (17) G 104 (23)   DATE COLLECTED (24) 012881 (29)

St. Clair Co. - LPC   REGION 5 (27)

Cahokia (Location) / Dead Creek (Responsible Party)

Legal (1); Illegal (2); Indicate One: 1 (28)   Board Order (X) (29)

Time Collected 11:45 a.m. p.m.   Unable to collect sample (X) (30)

Stick-up (31) 0.6 (33) ft.   Depth to water (from T.O.C.) (34) 16.5 (36) ft.

Sample temp. (37) — (39) °   Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 1 (41)

Sample Appearance: turbid odorless

Collector comments: Act recharge; casing broken off leaving (State expand casing)

C. Menn + T. Powell — Collected by — LPC — Div. or Company

B.C. Menn — Transported by — LPC — Div. or Company

LAB USE ONLY

No. B 36389

Rec'd JAN 29 1981

by [illegible] Time 4:00 a.m. p.m.

Sample temp. acceptable YES NO

Sample properly preserved YES NO

Completed

Forwarded

Supervisor Signature

LPCSM020
Lab Comments:

(27) - - - - - - - - (36)

(37) - - - - - - - - (46)

(27) - - - - - - - - (36)

(37) - - - - - - - - (66)

(67) - - - - - - - - (76)

Private Lab (X) (77)
IEPA Lab (X) (77)

Tests are to be performed on unfiltered samples. •Values no. of places shown are reported in the lab comments section. Tested but not run should also be explained in the lab comments section.

(11.)

27	X	[illegible]	[illegible]
31	X	[illegible] as N	[illegible]
37	X	[illegible] As	0.002
44	X	[illegible]	0.3
49	X	[illegible]	2
53	X	[illegible]	0.7
58	X	[illegible]	0.00
64	X	[illegible]	213.0
69	X	[illegible]	9
73	X	Chloride Cl	29

LPCSM010

27	X	Chromium Cr (tot)	0.00
33		Chromium Cr+6	X X
39	X	Copper Cu	0.14
45	X	Cyanide CN	0.00
52		Fecal Coli	X
56	`	Fluoride F	X X X X
61	X	Hardness CaCO3	717
65	X	Iron Fe	1.4
70	X	Lead Pb	0.00

LPCSM010

27	X	Magnesium Mg	49.1
32	X	Manganese Mn	1.4
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.0
51	X	Nitrate-nitrite N	0.5
56		Oil and Grease	X X X
60	X	pH (Units)	7.2
61	X	Phenolics	0.005
70	X	Phosphorus P	0.06
75	X	Potassium K	6.0

LPCSM050

27	X	B.O.D. (5 day)	X X X X
31		Selenium Se	0.002
36	X	Silver Ag	0.002
44	X	Sodium Na	15
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO_4	265
58	X	Zinc Zn	0.1
63			

CER 051824

E000783

[1] Alkalinity is to be determined as $CaCO_3$ ...

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Chemical
(1) Upstream	(1) Monitor Well	(1) Flow or Seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only)

L P C S M 0 1 0 (1)(8) SITE INVENTORY NUMBER General (9)(18)

MONITOR POINT NUMBER G165 (17)(20) DATE COLLECTED 012881 (21)(26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 1 (28) Board Order (X) (29)

Time Collected 10:55 p.m. Unable to collect sample (X) (30)

Stick-up 0.0 ft. (31)(33) Depth to water 14.0 ft. (from T.O.C.) (34)(36)

Sample temp. (37) ° (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 1 (41)

Sample Appearance: turbid; odorless

Collector comments: fast recharge; casing broke off at G.E.

R.C. Menn + T. Powell — LPC
Collected by — Div. or Company

R.C. Menn — LPC
Transported by — Div. or Company

LAB USE ONLY
Lab No. B 36390
Date Rec'd JAN 29 1981
Rec'd by [illegible] Time 4:00 p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded

Supervisor Signature

Name
Address of Lab

LPCSM020
Lab Comments:
(27) — (36)
(37) — (46)
(47) — (56)
(57) — (66)
(67) — (76)
Private Lab (X) (77)
IEPA Lab (X) (78)

LPCSM010

		Parameter	Value
27	X	Alkalinity[1]	332
31	X	Ammonia as N	2.7
37	X	Arsenic As	0.037
44	X	Barium Ba	1.9
49	X	BOD	0
53	X	Boron B	2
58	X	Cadmium Cd	0.00
64	X	Calcium Ca	314.2
69	X	COD	143
73	X	Chloride Cl	57

LPCSM030

		Parameter	Value
27	X	Chromium Cr (tot)	0.03
33		Chromium Cr[+6]	
39	X	Copper Cu	0.43
45	X	Cyanide CN	0.01
52		Fecal Coli	
56		Fluoride F	
61	X	Hardness CaCO3	1164
65	X	Iron Fe	0.8
70	X	Lead Pb	0.07

LPCSM040

		Parameter	Value
27	X	Magnesium Mg	73.6
32	X	Manganese Mn	4.19
38	X	Mercury Hg	0.000
45	X	Nickel Ni	0.2
51	X	Nitrate-nitrite N	0.0
56		Oil and Grease	
60	X	pH (Units)	7.0
63	X	Phenolics	0.22
70	X	Phosphorus P	[illegible]
75	X	Potassium K	13

LPCSM060

		Parameter	Value
27	X	R.O.E. (180°C)	
31		Selenium Se	0.003
36	X	Silver Ag	0.00
44	X	Sodium Na	50
49		SC (umhos/cm)	
53	X	Sulfate SO_4	262
58	X	Zinc Zn	1.5
63			

CER 051825

* Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

(4111)

E060783

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(T) Special
(1) Upstream	(1) Monitor well	(1) Flow or Seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only)

LPCSM010 (1)-(2) SITE INVENTORY NUMBER Several (4)-(16)

MONITOR POINT NUMBER 6166 (17)-(20) DATE COLLECTED 012881 (21)-(26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 1 (28) Board Order (X) (29)

Time Collected 11:30 a.m. p.m. Unable to collect sample (X) (30)

Stick-up 2.3 ft. (31)-(33) Depth to water 16.5 ft. (from T.O.C.) (34)-(36)

Sample temp. ° (37)-(39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: turbid; strong organic odor

Collector comments: fast recharge

P.C. Mann + T. Powell LPC
Collected by Div. or Company

P.C. Mann LPC
Transported by Div. or Company

LAB USE ONLY	LPCSM020 Lab Comments:
Lab No. B 34391	(27)————(36)
Date Rec'd JAN 29 1981	(37)————(46)
Rec'd by [illegible] Time 4:00 a.m. p.m.	(47)————(56)
Sample temp. acceptable YES NO	(57)————(66)
Sample properly preserved YES NO	(67)————(76)
Date completed	Private Lab (X) (77)
Date forwarded	IEPA Lab (X) (78)
Supervisor Signature	
Name	
Address of Lab	

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

(H111)

LPCSM030

		Parameter	Value
27	X	Alkalinity*	552
31	X	Aluminum Al	32
37	X	Arsenic As	0.11
44	X	Barium Ba	1.0
49	X	BOD	41
53	X	Boron B	3.7
58	X	Cadmium Cd	0.00
64	X	Calcium Ca	225.5
69	X	COD	212
73	X	Chloride Cl	156

LPCSM040

		Parameter	Value
27	X	Chromium Cr (tot)	0.00
33		Chromium Cr+6	X
39	X	Copper Cu	0.29
45	X	Cyanide CN	0.00
52		Fecal Coli	X X X
56		Fluoride F	X X
61	X	Hardness CaCO3	617 X X X
65	X	Iron Fe	67.5 X X
70	X	Lead Pb	0.00

LPCSM050

		Parameter	Value
27	X	Magnesium Mg	49.1 X X
32	X	Manganese Mn	2.1 X X
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.0 X X
51	X	Nitrate-nitrite N	0.0 X X X
56		Oil and Grease	X X X X
60	X	pH (Units)	X X 6.9 X X X
63	X	Phenolics	1.4
70	X	Phosphorus P	2 X X
75	X	Potassium K	62 X X X

LPCSM060

		Parameter	Value
27	X	T.O.C. (mg/l)	X X X X
31		Selenium Se	0.002
36	X	Silver Ag	0.00 X X
44	X	Sodium Na	94. X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO4	143. X X X
58	X	Zinc Zn	0.1 X X X
63		CER 051826	

*Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000784

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private well, Stream, Spring, Impounded water only)

L P C S M 0 1 0 (1)–(8) SITE INVENTORY NUMBER (9) General (18)

MONITOR POINT NUMBER (17) G107 (20) DATE COLLECTED (21) 012881 (26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 4 (28) Board Order (X) (29)

Time Collected 12:10 p.m. Unable to collect sample (X) (33)

Stick-up 1.2 ft. (31) (33) Depth to water 9.4 ft. (from T.O.C.) (34) (36)

Sample temp. (37) ° (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 1 (41)

Sample Appearance: very turbid; strong organic odor

Collector comments: fast recharge; well is silting in + contained sticks + grasses

R.C. Munn + T. Powell LPC
Collected by Div. or Company

R.C. Munn LPC
Transported by Div. or Company

LAB USE ONLY	LPCSM020 Lab Comments:
Lab No. B 36392	(27) — — — — (36)
Date Rec'd JAN 29 1981	(37) — — — — (46)
Rec'd by ____ Time 4:20 p.m.	(47) — — — — (56)
Sample temp. acceptable YES NO	(57) — — — — (66)
Sample properly preserved YES NO	(67) — — — — (76)
Date completed ____	Private Lab (X) (77)
Date forwarded ____	IEPA Lab (X) (78)
Supervisor Signature	
Name / Address of Lab	

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in lab comments section.

(H111)

LPCSM010

		Parameters[1]	ppm
27	X	[illegible]	21 X X X
32	X	Ammonia as N	0 X
37	X	Arsenic As	0.021
44	X	Barium Ba	1.6 X X X
49	X	BOD	52 X X X X
53	X	Boron B	0.5 X X X
58	X	Cadmium Cd	0.00 X X
64	X	Calcium Ca	1169.5 X X X
69	X	COD	635 X X X X
73	X	Chloride Cl	22 / X X X X

LPCSM030

27	X	Chromium Cr (tot)	2.29 X X
33		Chromium Cr^{+6}	. X X
39	X	Copper Cu	0.97 X X
45	X	Cyanide CN	0.00 X
52		Fecal Coli	X X X X
56	•	Fluoride F	X X X
61	X	Hardness $CaCO_3$	940 X X X X
65	X	Iron Fe	172 X X X
70	X	Lead Pb	0.32 X X

LPCSM040

27	X	Magnesium Mg	298.1 X X X
32	X	Manganese Mn	9.64 X X
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.5 X X X
51	X	Nitrate-nitrite N	0.2 X X X
56		Oil and Grease	X X X X
60	X	pH (Units)	X X 6.9 X X X
63	X	Phenolics	0.500 X
70	X	Phosphorus P	12 X X
75	X	Potassium K	20 X X X

LPCSM050

27	X	R.O.E. (180°C)	X X X X
31		Selenium Se	0.011 X
36	X	Silver Ag	0.00 X X
44	X	Sodium Na	60 X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO_4	276 X X X
58	X	Zinc Zn	1.5 X X X
63		CER 051827	

[1]Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000785

ILLINOIS [illegible] PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) [illegible]
(1) Upstream	(1) Monitor well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name: Private Well, Stream, Spring, Impounded Water only

L P C S M 0 1 3 (1) (13)

SITE INVENTORY NUMBER: General (9) (20)

MONITOR POINT NUMBER: 6168 (17) (20)

DATE COLLECTED: 012881 (21) (26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 4 (28) Board Order (X) (29)

Time Collected 2:15 p.m. Unable to collect sample (X) (30)

Stick-up 1.9 ft. (31) (33)

Depth to water (from T.O.C.) 14.7 ft. (34) (36)

Sample temp. — ° (37) (39)

Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: colorless, slightly detectable organic odor

Collector comments: Post recharge

R.C. Munn + T. Powell — Collected by — LPC — Div. or Company

B.C. Munn — Transported by — LPC — Div. or Company

LAB USE ONLY

Lab No. B 26393

Date Rec'd JAN 29 1981

Rec'd by [illegible] Time [illegible] a.m. p.m.

Sample temp. acceptable YES NO

Sample properly preserved YES NO

Date completed

Date forwarded

Supervisor Signature

Name
Address
of Lab

LPCSM020
Lab Comments:

(27) — — — — — — (36)
(37) — — — — — — (46)
(47) — — — — — — (56)
(57) — — — — — — (66)
(67) — — — — — — (76)

Private Lab (X) (77)

IEPA Lab (X) (77)

analyses are to be performed on unfiltered samples. *Values ceeding no. of places shown are reported in the lab comments section; sts requested but not run should also be explained in the lab comments section.

(HM)

27	X	[illegible]	[illegible]
31	X	[illegible]	[illegible]
37	X	[illegible]	0.004
44	X	[illegible]	0.5 [illegible]
49	X	[illegible]	[illegible]
53	X	[illegible]	2
55	X	[illegible]	0.00[illegible]
64	X	[illegible]	205.5[illegible]
69	X	[illegible]	8
73	X	Chloride Cl	74

LPCSM0[illegible]

27	X	Chromium Cr (total)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.00
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	*	Fluoride F	
61	X	Hardness CaCO3	564
65	X	Iron Fe	0.3
70	X	Lead Pb	0.0[illegible]

LPCSM0[illegible]

27	X	Magnesium Mg	34.3
32	X	Manganese Mn	0.34
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.0
52	X	Nitrate-nitrite N	3.5
56		Oil and Grease	
60	X	pH (Units)	7.1
63	X	Phenolics	0.010
70	X	Phosphorus P	0.23
75	X	Potassium K	16

LPCSM0[illegible]

27	X	R.O.E. (180°C)	
31		Selenium Se	0.004
36	X	Silver Ag	0.02
44	X	Sodium Na	30
49		SC (umhos/cm)	
53	X	Sulfate SO4	64
58	X	Zinc Zn	0.0
63			

CER 051828

*Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000786

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(Y) [illegible]
(1) Upstream	(1) Monitor well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) [illegible]
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only) ____

L P C S M 0 1 0 (1)(8) SITE INVENTORY NUMBER General (9)(18)

MONITOR POINT NUMBER G109 (17)(20) DATE COLLECTED 012881 (21)(26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 1 (28) Board Order (X) (29)

Time Collected 1:30 p.m. Unable to collect sample (X) (30)

Stick-up 3.4 ft. (31)(33) Depth to water 18.0 ft. (from T.O.C.) (34)(36)

Sample temp. ___ ° (37)(39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ____ 2 (41)

Sample Appearance: light green color; strong organic odor

Collector comments: Post recharge

R.C. Mann + T. Powell — LPC
Collected by — Div. or Company

R.C. Mann — LPC
Transported by — Div. or Company

LAB USE ONLY	LPCS#020 Lab Comments:
Lab No. B 36394	(27) ---------- (36)
Date Rec'd JAN 29 1981	(37) ---------- (46)
Rec'd by [signature] Time 4:00 p.m.	(47) ---------- (56)
Sample temp. acceptable YES NO	(57) ---------- (66)
Sample properly preserved YES NO	(67) ---------- (76)
Date completed ____	Private Lab (X) (77)
Date forwarded ____	IEPA Lab (X) (78)
Supervisor Signature	
Name ____	
Address of Lab ____	

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in lab comments section.

27	X	[illegible]	7
33	X	[illegible]	7
37	X	[illegible]	75
44	X	[illegible]	0.2
49	X	[illegible]	390
53	X	[illegible]	.2
58	X	[illegible]	0.14
64	X	[illegible]	446.7
69	X	[illegible]	1315
73	X	Chloride Cl	[illegible]

27	X	Chromium Cr (tot)	0.045
33		Chromium Cr+6	X
39	X	Copper Cu	94.1
45	X	Cyanide CN	0.00
52		Fecal Coli	X X X
56	*	Fluoride F	X X X
61	X	Hardness CaCO3	2144 X X X
65	X	Iron Fe	193. X X
70	X	Lead Pb	0.00 X

27	X	Magnesium Mg	134.4 X
32	X	Manganese Mn	8.39 X
38	X	Mercury Hg	0.0002
45	X	Nickel Ni	170. X X X
51	X	Nitrate-nitrite N	0.3 X X
56		Oil and Grease	X X X
60	X	pH (Units)	X X 4.1 X X
61	X	Phenolics	1.23 X
70	X	Phosphorus P	[illegible] X X
75	X	Potassium K	12 X X

27	X	R.O.E. (180°C)	X X X X
31		Selenium Se	0.006 X
36	X	Silver Ag	0.00 X X
44	X	Sodium Na	37 X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO4	2274 X X X
58	X	Zinc Zn	60.1 X X X
63			

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

HW11

CER 051829

E000787

ILLINOIS ENVIRONMENTAL [illegible] AGENCY
DIVISION OF LAND/NOISE [illegible] CONTROL
CHEMICAL ANALYSIS FORM

[illegible] Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	[illegible]
(1) Upstream	(1) Monitor Well	(1) [illegible]	[illegible]
(2) Mid-site	(2) Private well	(2) [illegible]	[illegible]
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name [illegible] (Private Well, Stream, Spring, Impounded Water Only)

L P C S M 0 2 0 (1) (2) SITE INVENTORY NUMBER General (15)

MONITOR POINT NUMBER G 1 1 6 (17) (20) DATE COLLECTED 0 1 2 8 8 1 (21) (26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2): Indicate One: 1 (28) Board Order (X) (29)

Time Collected 2:00 pm Unable to collect sample (X) (30)

Stick-up 1.1 ft. (31) (33) Depth to water 15.0 ft. (from T.O.C.) (34) (36)

Sample temp. ° (37) (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: slightly turbid; slight organic odor

Collector comments: Pastrechange

R.C. Mann + T. Powell — LPC
Collected by — Div. or Company

R.C. Mann — LPC
Transported by — Div. or Company

LAB USE ONLY
Lab No. B 36395
Date Rec'd JAN 29 1981
Rec'd by [illegible] Time 4:00 p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded

Supervisor Signature

Name
Address of Lab

LPCSM020
Lab Comments:

(27) ---------- (36)
(37) ---------- (46)
(47) ---------- (56)
(57) ---------- (66)
(67) ---------- (76)

Private Lab (X) (77)
IEPA Lab (X) (77)

[illegible]	X	[illegible]	[illegible]
[illegible]	X	[illegible]	[illegible]
[illegible]	X	[illegible]	0.013
[illegible]	X	[illegible]	[illegible]
[illegible]	X	[illegible]	0 [illegible]
[illegible]	X	[illegible]	[illegible]
[illegible]	X	[illegible]	0.00[illegible]
64	X	[illegible]	[illegible].4[illegible]
69	X	[illegible]	37 [illegible]
73	X	Chloride Cl	[illegible]

27	X	Chromium Cr (Total)	0.025
33		Chromium Cr+6	X X
39	X	Copper Cu	0.11 X X
45	X	Cyanide CN	0.02
52		Fecal Coli	X X X X
56		Fluoride F	X X X
61	X	Hardness CaCO3	447 X X X X
65	X	Iron Fe	9.1 X X X
70	X	Lead Pb	0.00 X X

27	X	Magnesium Mg	43.5 X X X
32	X	Manganese Mn	2.77 X X
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.9 X X X
51	X	Nitrate-nitrite N	12. X X X
56		Oil and Grease	X X X X
60	X	pH (Units)	X X 6.9 X X X
61	X	Phenolics	0.020 X
70	X	Phosphorus P	0 X X
75	X	Potassium K	75 X X X

LPCSM020

27	X	R.O.E. (180°C)	X X X X
31		Selenium Se	0.016 X
36	X	Silver Ag	0.00 X X
44	X	Sodium Na	13 X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO_4	57 X X X
55	X	Zinc Zn	2.0 X X X
61		CER 051830	

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in lab comments section.

*Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

H/A/1

E000755

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Other
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only)

L P C S M 0 1 0 (1) (8) SITE INVENTORY NUMBER General (16)

MONITOR POINT NUMBER 6 1 1 1 (17) (20) DATE COLLECTED 0 1 2 8 8 1 (21) (26)

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 1:45 pm Unable to collect sample (X) (30)

Stick-up 1.5 ft. (31) (33) Depth to water 16.2 ft. (from T.O.C.) (34) (36)

Sample temp. — ° (37) (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: slightly turbid; slight unidentifiable odor

Collector comments: fast recharge; when sample exposed to skin it caused a burning sensation

P.C. Menn + T. Powell LPC
Collected by Div. or Company

P.C. Menn LPC
Transported by Div. or Company

LAB USE ONLY	LPCSM020 Lab Comments:
Lab No. R 36396	(27) — — — — — — (36)
Date Rec'd JAN 29 1981	(37) — — — — — — (46)
Rec'd by [illegible] Time 4:00 a.m. p.m.	(47) — — — — — — (56)
Sample temp acceptable YES NO	(57) — — — — — — (66)
Sample properly preserved YES NO	(67) — — — — — — (76)
Date completed	Private Lab (X) (77)
Date forwarded	IEPA Lab (X)
Supervisor Signature	
Name	
Address of Lab	

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in lab comments section.

4111

		[illegible]	[illegible]
27	X	[illegible]	22
31	X	[illegible]	
37	X	Arsenic As	0.015
44	X	Barium Ba	0.7
49	X	Boron B	2
52	X	Cadmium Cd	0.2
55	X	Chromium Cr	0.00
64	X	Chromium Cr	2.4
69	X	COD	28
73	X	Chloride Cl	12

		[illegible]	
27	X	Chromium Cr (total)	0.02
33		Chromium Cr+6	X
39	X	Copper Cu	0.04
45	X	Cyanide CN	0.02
52		Fecal Coli	X X X
56		Fluoride F	X X X
61	X	Hardness $CaCO_3$	530 X X X X
65	X	Iron Fe	10.7
70	X	Lead Pb	0.00

		[illegible]	
27	X	Magnesium Mg	37.9
32	X	Manganese Mn	1.76
38	X	Mercury Hg	0.0005
45	X	Nickel Ni	0.0
51	X	Nitrate-nitrite N	0.5 X X X
56		Oil and Grease	X X X X
60	X	pH (Units)	X X 7.0 X X X
63	X	Phenolics	0.213
70	X	Phosphorus P	0.57
75	X	Potassium K	4.2

		[illegible]	
27	X	R.O.E. (180°C)	X X X X
31		Selenium Se	0.002
36	X	Silver Ag	0.00
44	X	Sodium Na	14 X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO_4	153 X X X
58	X	Zinc Zn	0.1 X X X
63			

CER 051831

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000759

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Other
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only) ______

L P G S W 0 1 0 (1)–(8) SITE INVENTORY NUMBER (9)–(16) General

MONITOR POINT NUMBER (17)–(20) G112 DATE COLLECTED (21)–(26) 012881

St. Clair Co. - LPC REGION (27) 5

Cahokia / Dead Creek
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: (28) 1 Board Order (X) (29)

Time Collected 2:40 pm Unable to collect sample (X) (30)

Stick-up (31)–(33) 2.7 ft. Depth to water (from T.O.C.) (34)–(36) 18.1 ft.

Sample temp. (37)–(39) ° Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ______ (41) 2

Sample Appearance: colorless; organic odor detected

Collector comments: fast recharge

P.C. Menn + T. Powell — LPC
Collected by — Div. or Company

P.C. Menn — LPC
Transported by — Div. or Company

LAB USE ONLY

Lab No. B 30397
Date Rec'd JAN 29 1981
Rec'd by [illegible] Time [illegible] a.m. p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed ______
Date forwarded ______

______
Supervisor Signature

Name ______
Address of Lab ______

LPCSU020
Lab Comments:

(27) ------------ (36)
(37) ------------ (46)
(47) ------------ (56)
(57) ------------ (66)
(67) ------------ (76)

Private Lab (X) (77)
IEPA Lab (X) (77)

		Parameter	Value
27	X	[illegible]	[illegible]
31	X	[illegible]	[illegible]
37	X	[illegible]	0027
44	X	[illegible]	0.5
49	X	[illegible]	10
53	X	[illegible]	[illegible]
58	X	[illegible]	0.00
64	X	[illegible]	[illegible] 9.3
69	X	[illegible]	47
73	X	Chloride Cl	210

		LPCSU010	
27	X	Chromium Cr (total)	2.00
33		Chromium Cr+6	X X
39	X	Copper Cu	0.23
45	X	Cyanide CN	0.01
52		Fecal Coli	X X X X
56		Fluoride F	X X X
61	X	Hardness CaCO3	426 X X X X
65	X	Iron Fe	13.5
70	X	Lead Pb	2.00

		LPCSU0[illegible]	
27	X	Magnesium Mg	54.0
32	X	Manganese Mn	2.79
38	X	Mercury Hg	0.0006
45	X	Nickel Ni	0.0 X X X
51	X	Nitrate-nitrite N	0.0 X X X
56		Oil and Grease	X X X X
60	X	pH (Units)	X X 6.9 X X X
63	X	Phenolics	0.052
70	X	Phosphorus P	0.53
75	X	Potassium K	20 X X X

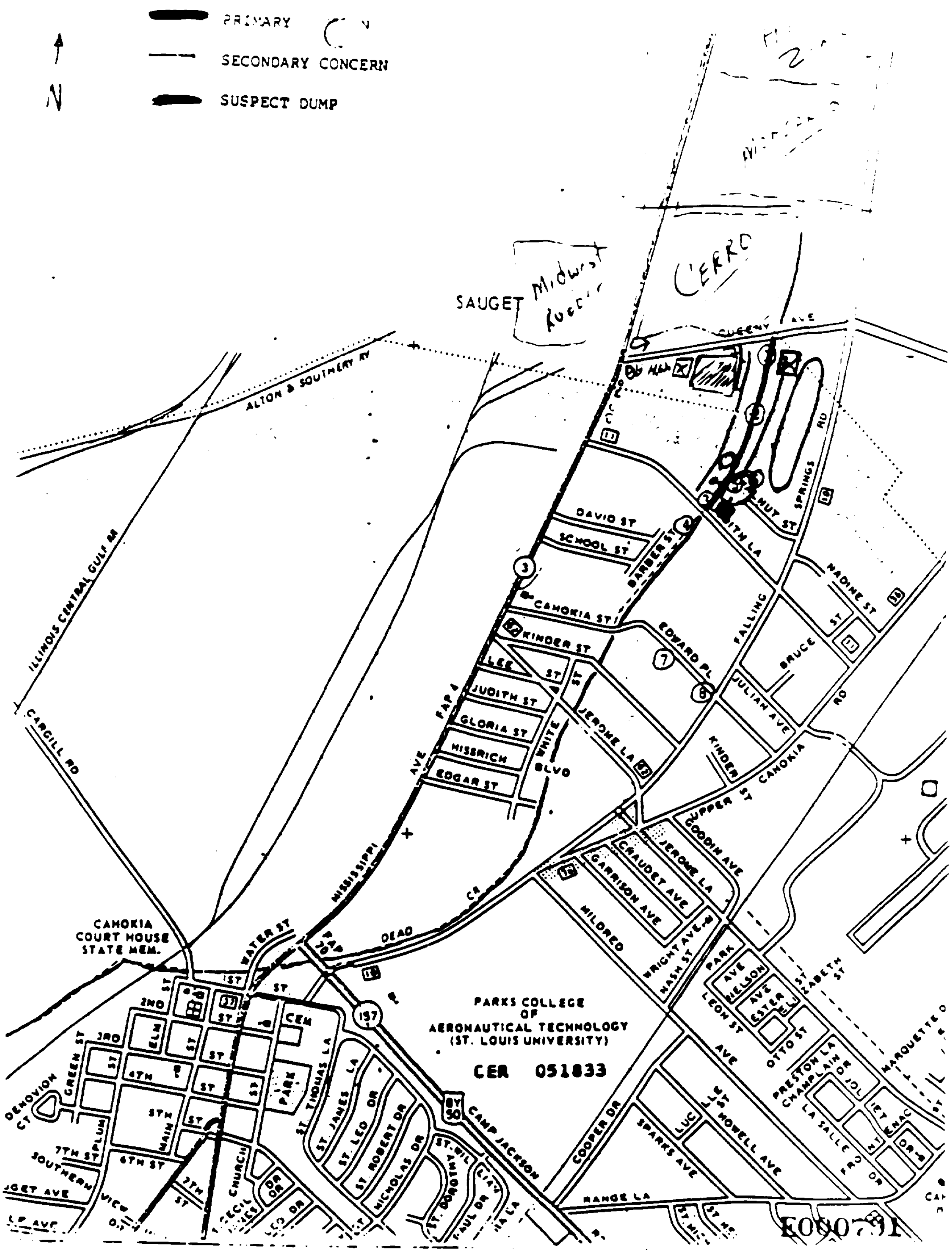
		LPCSU0[illegible]	
27	X	R.O.E. (180°C)	X X X X
31		Selenium Se	0.000
36	X	Silver Ag	0.00
44	X	Sodium Na	13 X X X
49		SC (umhos/cm)	X X X X
53	X	Sulfate SO4	34 X X X
58	X	Zinc Zn	2.9 X X X
63		CER	051832

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in lab comments section.

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

(411)

E000790


PRIMARY
SECONDARY CONCERN
SUSPECT DUMP
N
SAUGET
Midwest
CERRO
QUEENY AVE
ALTON & SOUTHERN RY
ILLINOIS CENTRAL GULF RR
CARGILL RD
DAVID ST
SCHOOL ST
BARBER ST
CAHOKIA ST
KINDER ST
EDWARD PL
LEE ST
JUDITH ST
GLORIA ST
HISSRICH
EDGAR ST
WHITE BLVD
FAP 4
MISSISSIPPI AVE
JEROME LA
JULIAN AVE
FALLING SPRINGS RD
NUT ST
MADINE ST
BRUCE ST
KINDER ST
UPPER CAHOKIA RD
GOODIN AVE
JEROME LA
CHAUDET AVE
GARRISON AVE
MILDRED
BRIGHT AVE
NASH ST
PARK AVE
NELSON AVE
ESTER
LEON ST
OTTO ST
ELIZABETH ST
DEAD CR
CANOKIA COURT HOUSE STATE MEM.
WATER ST
1ST ST
2ND
3RD
4TH ST
5TH ST
6TH ST
7TH ST
ELM ST
MAIN ST
GREEN ST
PLUM
CHURCH
CEM
PARK
ST. THOMAS LA
ST. JAMES LA
ST. LEO DR
ST ROBERT DR
NICHOLAS DR
ST. DOROTHY
CAMP JACKSON
DENOVION CT
SOUTHERN VIEW
PARKS COLLEGE OF AERONAUTICAL TECHNOLOGY (ST. LOUIS UNIVERSITY)
CER 051833
COOPER DR
SPARKS AVE
HOWELL AVE
RANGE LA
PRESTON LA
CHAMPLAIN DR
LA SALLE
MARQUETTE
157
FAP 70

ILLINOIS ENVIRONMENTAL [illegible]ECTION AGENCY
DIVISION OF LAND/NOISE [illegible]OLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(1) Surface Water	(2) Ground Water	(3) Leachate
(1) Stream	(1) Monitor Well	(1) Pipe or Seep
(2) [illegible]	Private Well	(2) Pond
[illegible]	[illegible]	Collection System
Runoff	Lysimeter	
(5) Impounded	(5) Public W S	

Monitor Well

Name [illegible]

L P [illegible] SITE INVENTORY NUMBER General

MONITOR POINT NUMBER G 1 1 2 DATE COLLECTED 0 2 3 1 8 1

St. Clair Co. - LPC REGION 5 (27)

Cahokia / Dead Creek
(Location) (Responsible Party)

[illegible] (1): Illegal (2): Indicate [illegible] 2 Board Order (X)

Time Collected 2:10 p.m. [illegible] to collect sample (X)

Stick-up 2.7 ft. Depth to water 12.6 ft. (from T.O.C.)

Sample temp. [illegible] Background (X). . . .

Ground water sampled by (Indicate [illegible]): (1) Bailing; (2) Pumping; (3) Other (Specify) 2

Sample Appearance: slightly oily & organic odor detected

Collector comments: Fast Recharge
Removed one Volume Filtered Samples

Ken Bosie — LPC
Collected by — Div. or Company

Transported by — Div. or Company

LAB USE ONLY	LPCSM020 Lab Comments:
Lab No. BU47226	*SAMPLE DISCARDED PREMATURELY (27) (36)
Date Rec'd APR -1 1981	(37) (46)
Rec'd by [signature] Time 11:30 a.m.	(47) (56)
Sample temp. acceptable YES NO	(57) (66)
Sample properly preserved YES NO	(67) (76)
Date completed	Private Lab (X) (77)
Date forwarded MAY 7 1981	IEPA Lab (X) (78)
Supervisor Signature	
Name / Address of Lab [stamp]	

* Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

		Parameter	Value
[illegible]	X	[illegible]	489
31	X	[illegible]	2
[illegible]	X	[illegible]	[illegible]
[illegible]	X	[illegible]	[illegible]
[illegible]	X	[illegible]	3
[illegible]	X	[illegible]	3.7
[illegible]	X	[illegible]	0.13
[illegible]	X	[illegible]	270.
[illegible]	X	[illegible]	55
[illegible]	X	[illegible]	227

		Parameter	Value
27	X	Arsenic [illegible]	0.00
33		[illegible]	
39	X	Copper [illegible]	0.41
[illegible]	X	[illegible]	0.00
		[illegible]	
[illegible]	X	[illegible]	0.7
[illegible]	X	[illegible]	880
65	X	Iron [illegible]	1.2
70	X	[illegible]	0.00

		Parameter	Value
27	X	Chloride [illegible]	81.
32	X	Manganese Mn	2.74
14	X	Mercury Hg	0.000C
46	X	Nickel Ni	0.3
51	X	Nitrate-nitrite	0.1
56	X	Oil and Grease	0
60	X	pH (Units)	6.3
61	X	Phenolics	0.010
70	X	Phosphorus P	0.03
75	X	[illegible]	480

		Parameter	Value
27	X	Alkalinity [illegible][1]	NTA*
31	X	[illegible]	0.001
36	X	Silver Ag	0.00
44	X	Sodium Na	164.
49	X	SC (umhos/cm)	2220
53	X	Sulfate SO_4	554.
58	X	[illegible]	7
63	X	Sulfide	0.00

[1] Alkalinity [illegible] $CaCO_3$ at pH 4.5.

CER 051834

E000792

LPC-8 Rev. 7/77

G-106 Priority

Time Collected: 11:50 AM

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # D012734

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well [redacted]
G-106

PHYSICAL OBSERVATIONS, REMARKS: Turbid - very strong organic odor

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CMC ECV DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

[illegible signature]

PCBs <0.1 μg/l

< 0.1 PPB

CER 051835

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000793
D12734

C-105 C Priority C

Time Collected: 10:55 Lab # D018737

SPECIAL ANALYSIS FORM

Date Collected: 1-28-81 Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well C-105

PHYSICAL OBSERVATIONS, REMARKS: odorless - turbid - very fast rec

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbon

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CMC ECN DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81 J Hurley

PCBs < 0.1 ug/l

< 0.1 PPB

RECEIVED
~~OCT 15 1981~~
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051836

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000794

D018737

Time Collected: 11:45 AM

Date Collected: 1-28-81

Lab DU12732

SPECIAL ANALYSIS FORM

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well G-104

PHYSICAL OBSERVATIONS, REMARKS: odorless - turbid

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMc ECP DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J. Hurley

PCBs = 0.3 ug/l

0.3 ppb

RECEIVED
OCT 15 1981
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051837

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

DU12732 E000795

G-103 Priority C

Time Collected: 11:30 AM

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # DU12731

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well G-103

PHYSICAL OBSERVATIONS, REMARKS: odorless - slightly turbid

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMC Elo DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J Hurley

PCBs < 0.1 µg/l

< 0.1 ppb

RECEIVED
OCT 15 1981
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051838

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000796
DU12731

G-102 Priority

Time Collected: 11:20 AM

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # DU19730

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) Monitoring well G-102

PHYSICAL OBSERVATIONS, REMARKS: odorless - turbid

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMC ECP DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J Hurley

PCBs = 3.9 ug/l

3.9 PPB

RECEIVED
OCT 15 1981
IL E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051839

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

DU19730 E000797

PRIORITY

Time Collected: 11:55 AM Lab # 0019729

SPECIAL ANALYSIS FORM

Date Collected: 1-28-81 Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) WELL G-101

PHYSICAL OBSERVATIONS, REMARKS: odorless – slightly turbid

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CWC ECO DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

D. Hurley

PCBs = 0.22 ug/l

22 ppb

RECEIVED
OCT 15 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051840

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000798
0019729

X-1

Time Collected: 2:05 pm

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # D019727

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) sample X-1 was collected from a field from a point ~100 yds west of 6108

PHYSICAL OBSERVATIONS, REMARKS: sample is a sludge like oily-tar like substance having a similiar type odor

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CMC ECD DATE COMPLETED: 3-14-81 DATE FORWARDED: 3-19-81

[illegible signature]

[illegible handwriting] (ppm)

74 PPM

RECEIVED
OCT 15 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051841

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000799

D019727

Priority

Time Collected: 2:10 pm

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # D012773

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact location) sample X-2 was collected from the wheat field immediately adjacent to where X-1 was collected

PHYSICAL OBSERVATIONS, REMARKS: sample generally appears to be uncontaminated top soil.

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: C McGee DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J Henley

PCB 75 ug/kg (ppb)

75 PPB

RECEIVED
OCT 15 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051842

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000800
D012773

Time Collected: 3:15 PM

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # D012776

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) S-56 was collected from the North pond at the northern end of Cerro Copper's property, adjacent to Monsanto's proper

PHYSICAL OBSERVATIONS, REMARKS: Bright Brownish-orange color, oil film on surface, strong organic odor.

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CMC

DATE COMPLETED: 3-19-81

DATE FORWARDED: 3-19-81

J Hursley

PCBs < 0.1 μg/l

< 1 ppb

RECEIVED
OCT 15 1981
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051843

LPC-8A 4/77

(NOT FOR DATA PROCESSING)

E000801

D012776

Priority

Time Collected: 3:08 pm

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # DU12725

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) S501 was collected from the south pond at the south end located on Cerro's property

PHYSICAL OBSERVATIONS, REMARKS: greenish gray color with slight odor detected.

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMC | DATE COMPLETED: 3-19-81 | DATE FORWARDED: 3-19-81

J. Hurley

2 PPB

RECEIVED
OCT 15 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051844

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000802
DU12725

G-11a

Time Collected: 2:40 PM   Priority (Lab # D012740

SPECIAL ANALYSIS FORM

Date Collected: 1-28-81   Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well G-112

PHYSICAL OBSERVATIONS, REMARKS: colorless slight organic odor

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMC Gal   DATE COMPLETED: 3-19-81   DATE FORWARDED: 3-19-81

J Hurley

PCBs < 0.1 ug/l   < 0.1 PPB

Chlorobenzene = 25. ug/l (ppb)   25 PPB

Chloroaniline = 21 ug/l (ppb)   21 PPB

RECEIVED
OCT 15 1981
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051845

LPC-8A 4/77   (NOT FOR DATA PROCESSING)

E000803
D012740

G-111

Priority

Time Collected: 1:45 PM

Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # 0012779

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well G-111

PHYSICAL OBSERVATIONS, REMARKS: slightly turbid, slight unidentifiable odc

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CMC for

DATE COMPLETED: 3-19-81

DATE FORWARDED: 3-19-81

J Hurley

PCBs < 0.1 ug/l

< 0.1 PPB

CER 051846

LPC-8A 4/77

(NOT FOR DATA PROCESSING)

E000804

D012779

Time Collected: 2:15 pm Lab # 0012738

Date Collected: 1-28-81 SPECIAL ANALYSIS FORM Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) Monitoring well C-110

PHYSICAL OBSERVATIONS, REMARKS: slightly turbid, slight organic odor

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: C McEly DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81 [illegible]

PCBs < 0.1 ug/l

< 0.1 ppb

CER 051847

RECEIVED
OCT 15 1981
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

LPC-8A 4/77 (NOT FOR DATA PROCESSING) E000805

0012738

C-109 Priority

Time Collected: 1:20 PM
Date Collected: 1-28-81

SPECIAL ANALYSIS FORM

Lab # 0019737
Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia/Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) Monitoring well C-109

PHYSICAL OBSERVATIONS, REMARKS: light green color - strong organic odor.

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMC EUP DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J Harley

PCB's < 0.1 mg/l

Chlorobenzenes Not detected

< 0.1 PPB

CER 051848

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000896

G-108 (Priority)

Time Collected: 2:15 PM Lab # UU12736

SPECIAL ANALYSIS FORM

Date Collected: 1-28-81 Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) Monitoring well G-108

PHYSICAL OBSERVATIONS, REMARKS: colorless, slight organic odor

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Perry Mann + Tom Powell TRANSPORTED BY: Perry Mann

LABORATORY

RECEIVED BY: CMC ECP DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J. Hurley

PCBs < 0.1 mg/l

< 0.1 ppb

CER 051849

RECEIVED
OCT 15 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

E000807
UU12736

G-107 Priority

Time Collected: 12:10 PM

Date Collected: 1-28-81

DU12735

Lab #

SPECIAL ANALYSIS FORM

Date Received JAN 29 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location) monitoring well G-107

PHYSICAL OBSERVATIONS, REMARKS: very turbid - strong organic odor

TESTS REQUESTED: P.C.B.'s + Chlorinated Hydrocarbons

COLLECTED BY: Terry Mann + Tom Powell TRANSPORTED BY: Terry Mann

LABORATORY

RECEIVED BY: CMC FLY DATE COMPLETED: 3-19-81 DATE FORWARDED: 3-19-81

J. Huntley

PCBs	= ~~0.3~~ 0.4 ug/l (PPb)	0.4 PPB
Chlorobenzene	= 63 ug/e (PPb)	63 PPB
Chloroaniline	= 90 ug/e	90 PPB
Dichlorophenol	= 560 ug/l	560 PPB

CER 051850

RECEIVED
OCT 15 1981
ILL. E.P.A. - DLPC
STATE OF ILLINOIS

E000895

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

DU12735

Time Collected: 1:34 P.M.   Lab # D020139

SPECIAL ANALYSIS FORM

Date Collected: 3-10-81   Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA / DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G-111 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED 2 QTS.

TESTS REQUESTED: PCB - CLORINATED HYDROCARBONS

COLLECTED BY: KEN BOSVE & DOUG TOLAN DLPC   TRANSPORTED BY: KEN BOSVE & DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC   DATE COMPLETED: DATE FORWARDED: 4/28/81

PCBS < 0.1 ug/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

E000809

LPC-8A 4/77   (NOT FOR DATA PROCESSING)   D020139   KM

CER 051851   PCM ✓ TP ✓

D020138

Time Collected: 2:15 P.M. Lab #

SPECIAL ANALYSIS FORM

Date Collected: 3-10-81 Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G 110 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED 2 QTS.

TESTS REQUESTED: PCB - CLORINATED HYDROCARBONS
deleted per instruction of [illegible]

COLLECTED BY: KEN BRUE & DOUG TOLAN DLPC TRANSPORTED BY: KEN BRUE & DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81
[illegible signature]

PCB 0.9 μg/l

RECEIVED
MAY 21 1981
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. - D.L.P.C.
STATE OF ILLINOIS

D020138

LPC-8A 4/77 (NOT FOR DATA PROCESSING) CER 051852

E000810

D020137

Time Collected: 8:32 A.M. Lab # MAR 11 1981

Date Collected: 3-11-81 SPECIAL ANALYSIS FORM Date Received

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G 109 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: VERY STRONG ODOR - DIRTY
REMOVED ONE VOLUME 3-10-81
BAILED 2 QTS.

TESTS REQUESTED: PCB - ~~CLORINATED HYDROCARBONS~~
deleted per instruction of DLPC
DLPC

COLLECTED BY: KEN BOSLE & DOUG TOLAN TRANSPORTED BY: KEN BOSLE & DOUG TOLAN

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81

PCB < 0.1 ug/l

CER 051853

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

LPC-8A 4/77 (NOT FOR DATA PROCESSING) D020137

E000811

Time Collected: 12:58 P.M.
Date Collected: 3-10-81

SPECIAL ANALYSIS FORM

Lab #

Date Received

D020136
MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G 108 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED ONE QT.

TESTS REQUESTED: PCB

COLLECTED BY: KEN BOSIE + DOUG TOLAN DLPC TRANSPORTED BY: KEN BOSIE + DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81

PCB < 0.1 µg/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051854

LPC-8A 4/77 (NOT FOR DATA PROCESSING) D020136

E000812

D020135

Time Collected: 4:59 P.M.

Lab #

SPECIAL ANALYSIS FORM

Date Collected: 3-10-81

Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G 107 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: DIRTY STRONG ODOR
REMOVED ONE VOLUME
BAILED 2 QTS.

TESTS REQUESTED: PCB & ~~CLORINATED HYDROCARBONS~~
deleted per instruction – [illegible] DLPC

COLLECTED BY: KEN BOSIE & DOUG TOLAN DLPC TRANSPORTED BY: KEN BOSIE & DOUG TOLAN

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81
J Hurley

PCB 0.37 [illegible]

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
~~STATE OF ILLINOIS~~

~~RECEIVED~~
~~APR 29 1981~~
~~E.P.A. – D.L.P.C.~~
STATE OF ILLINOIS

CER 051855

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

D020135

E000813

Time Collected: 5:15 P.M.   Lab # 20134
SPECIAL ANALYSIS FORM
Date Collected: 3-10-81   Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)
G 106 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: DIRTY & STRONG ODOR
REMOVED ONE VOLUME
BAILED 2 QTS.

TESTS REQUESTED: PCB – ~~CLORINATED HYDROCARBONS~~
deleted per instruction of Ron ... DLPC

COLLECTED BY: KEN BOWE & DOUG TOLAN DLPC   TRANSPORTED BY: KEN BOWE & DOUG TOLAN

LABORATORY

RECEIVED BY: CMC   DATE COMPLETED: DATE FORWARDED: 4/28/81

PCB 2.4 ug/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051856

LPC-8A 4/77   (NOT FOR DATA PROCESSING)

20134 E000824

D020133

Time Collected: 5:C P.M.

Lab #

Date Collected: 3-10-81

SPECIAL ANALYSIS FORM

Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G 105 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED 1 QT.

TESTS REQUESTED: PCB

COLLECTED BY: KEN BOSE + DOUG TOLAN DLPC TRANSPORTED BY: KEN BOSE + DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81

PCB < 0.1 μg/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
EPA – D.L.P.C.
STATE OF ILLINOIS

CER 051857

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

D020133

E000815

D020132

Time Collected: 4:20P.M. Lab #

SPECIAL ANALYSIS FORM

Date Collected: 3-10-81 Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location)

G 104 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED 1 QT.

TESTS REQUESTED: PCB

COLLECTED BY: KEN BOLIE & DOUG TOLAN DLPC TRANSPORTED BY: KEN BOLIE & DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81

J Hurley

PCB 0.1 ug/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CER 051858

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

D020132

E000826

D020131

Time Collected: 5:26 P.M.

Date Collected: 3-10-81

SPECIAL ANALYSIS FORM

Lab #

Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR

FILE HEADING: CAHOKIA / DEAD CREEK

FILE NUMBER:

SOURCE OF SAMPLE: (Exact Location)
G 103 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED 1 QT.

TESTS REQUESTED: PCB

COLLECTED BY: KEN BUSIE & DOUG TOLAN DLPC TRANSPORTED BY: KEN BUSIE & DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC

DATE COMPLETED:

DATE FORWARDED: 4/28/81 J Hinley

PCB < 0.1 ug/L

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
~~STATE OF ILLINOIS~~

RECEIVED
APR 29 1981
~~E.P.A.~~ – D.L.P.C.
STATE OF ILLINOIS

CER 051859

LPC-8A 4/77

(NOT FOR DATA PROCESSING)

D020131

E000817

D020130

Time Collected: 3:50 P.M.

Lab #

SPECIAL ANALYSIS FORM

Date Collected: 3-10-81

Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY: ST. CLAIR

FILE HEADING: CAHOKIA/DEAD CREEK

FILE NUMBER:

SOURCE OF SAMPLE: (Exact Location)

G 102 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME
BAILED ONE QT.

TESTS REQUESTED: PCB

COLLECTED BY: KEN BOJIE + DOUG TOLAN DLPC

TRANSPORTED BY: KEN BOJIE + DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC

DATE COMPLETED:

DATE FORWARDED: 4/28/81

J Hurley

PCB 0.46 ug/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

LPC-8A 4/77

(NOT FOR DATA PROCESSING)

D020130

CER 051860

E000828

Time Collected: 4:47 P.M.

Date Collected: 3-10-81

SPECIAL ANALYSIS FORM

Lab #

Date Received MAR 11 1981

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CREEK	

SOURCE OF SAMPLE: (Exact Location) G101 (MONITOR WELL)

PHYSICAL OBSERVATIONS, REMARKS: REMOVED ONE VOLUME ~~Pumping~~ BAILED 1 QT.

TESTS REQUESTED: PCB

COLLECTED BY: KEN BOHNE + DOUG TOLAN DLPC TRANSPORTED BY: KEN BOHNE + DOUG TOLAN DLPC

LABORATORY

RECEIVED BY: CMC DATE COMPLETED: DATE FORWARDED: 4/28/81

PCB 0.13 μg/l

RECEIVED
MAY 21 1981
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

RECEIVED
APR 29 1981
E.P.A. – D.L.P.C.
STATE OF ILLINOIS

LPC-8A 4/77 (NOT FOR DATA PROCESSING) CER 051861

D020129

E000829

WL2

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only): MONITOR WELL

L P C S M 0 1 0 (1)–(8)   SITE INVENTORY NUMBER (9)–(16)

MONITOR POINT NUMBER (17)–(21): G109   DATE COLLECTED (22)–(26): 031181

ST. CLAIR Co. - LPC REGION (27): 5

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28)   Board Order (X) (29)

Time Collected 8:32 p.m.   Unable to collect sample (X) (30)

Stick-up 03.5 ft. (31)–(33)   Depth to water 19.1 ft. (from T.O.C.) (34)–(36)

Sample temp. (37)–(39) °   Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other Specify) 2 (41)

Sample Appearance: DIRTY - VERY STRONG ODOR
T.D.W. - 373

Collector comments: REMOVED ONE VOLUME 3-10-81.
FILTERED SAMPLES EXCEPT OIL & GREASE.

KEN BOSIE & DOUG TOLAN   DLPC
Collected by   Div. or Company

KEN BOSIE & DOUG TOLAN   DLPC
Transported by   Div. or Company

LAB USE ONLY
Lab No. BU43549
Date Rec'd MAR 11 1981
Rec'd by [illegible]   Time 5 p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded MAR 30 1981

Supervisor Signature

Name
Address of Lab
CHAMPAIGN

LPCSM020
Lab Comments:
(27)————(36)
(37)————(46)
(47)————(56)
(57)————(66)
(67)————(76)
Private Lab (X) (77)
IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

		PARAMETERS*	mg/l
27	X	Alkalinity[1]	58
31	X	Ammonia as N	45
37	X	Arsenic As	3.9
44	X	Barium Ba	0.1
49	X	BOD	335
53	X	Boron B	0.5
55	X	Cadmium Cd	0.07
64	X	Calcium Ca	431.
69	X	COD	930
73	X	Chloride Cl	24.
27	X	Chromium Cr (total)	0.01
33		Chromium Cr+6	
39	X	Copper Cu	67.0
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	X	Fluoride F	7.7
61	X	Hardness CaCO3	1662
65	X	Iron Fe	1.4
70	X	Lead Pb	0.0
27	X	Magnesium Mg	138.
32	X	Manganese Mn	6.22
38	X	Mercury Hg	0.0003
45	X	Nickel Ni	123.
51	X	Nitrate-nitrite N	0.3
56	X	Oil and Grease	1.
60	X	pH (Units)	4.6
63	X	Phenolics	1.46
70	X	Phosphorus P	2.2
75	X	Potassium K	6.4
27	X	T.D.S. (180°C)	3880
31	X	Selenium Se	0.003
36	X	Silver Ag	0.00
44	X	Sodium Na	12.1
49	X	SC (umhos/cm)	3440
53	X	Sulfate SO_4	2629.
58	X	Zinc Zn	6.3
63	X	SULFIDE	000

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000820

CER 051862

LPC 8 3/77

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private well, Stream, Spring, Impounded Water only): MONITOR WELL

LPCSM010 (1)(3)   SITE INVENTORY NUMBER (4) ________ (16)

MONITOR POINT NUMBER (17) G107 (20)   DATE COLLECTED (21) 031181 (26)

ST. CLAIR Co. - LPC REGION 5 (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2): Indicate One: 2 (28)   Board Order (X) (29)

Time Collected 7:51 p.m.   Unable to collect sample (X) (30)

Stick-up (31) (33) ft.   Depth to water (from T.O.C.) (34) 107 (36) ft.

Sample temp. (37) (39) °   Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ________ 2 (41)

Sample Appearance: ________

T.D.W. - 27?

Collector comments: REMOVED ONE VOLUME 3-10-81; FILTERED SAMPLES EXCEPT. OIL & GREASE

KEN BOSIE & DOUG TOLAN   DLPC
Collected by   Div. or Company

KEN BOSIE & DOUG TOLAN   DLPC
Transported by   Div. or Company

LAB USE ONLY
Lab No. BU43547
Date Rec'd MAR 11 1981
Rec'd by [illegible] Time 5 p.m.
Sample temp acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded MAR 30 1981
Supervisor Signature
Name
Address of Lab

LPCSM020
Lab Comments:
(27) ________ (36)
(37) ________ (46)
(47) ________ (56)
(57) ________ (66)
(67) ________ (76)
Private Lab (X) (77)
IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

LPC-8 REV. 7/77

LPCSM030

		PARAMETERS	ppm
27	X	Alkalinity[1]	651
31	X	Ammonia as N	0.2
37	X	Arsenic As	0.004
44	X	Barium Ba	0.1
49	X	BOD 5	39
53	X	Boron B	0.5
58	X	Cadmium Cd	0.001
64	X	Calcium Ca	186
69	X	COD	47
73	X	Chloride Cl	235

LPCSM040

27	X	Chromium Cr (tot)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.01
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	X	Fluoride F	0.7
61	X	Hardness CaCO3	1096
65	X	Iron Fe	2.4
70	X	Lead Pb	0.0

LPCSM050

27	X	Magnesium Mg	44.8
32	X	Manganese Mn	2.12
38	X	Mercury Hg	0.0002
46	X	Nickel Ni	0.0
51	X	Nitrate-nitrite N	0.0
56	X	Oil and Grease	1
60	X	pH (Units)	6.7
63	X	Phenolics	170
70	X	Phosphorus P	0.03
75	X	Potassium K	2.9

LPCSM060

27	X	T.D.E. (180°C)	1610
31	X	Selenium Se	0.000
37	X	Silver Ag	0.01
44	X	Sodium Na	39
49	X	SC (umhos/cm)	2290
53	X	Sulfate SO4	313
58	X	Zinc Zn	0.1
63	X	SULFIDE	0.00

[1]Alkalinity is to be determined as ppm of CaCO3 at pH 4.5.

E000821

CER 051863

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Runoff	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name: MONITOR WELL (Private Well, Stream, Spring, Impounded Water only)

L P C S M 0 1 0 (1) (8) SITE INVENTORY NUMBER (9) — — — — — — — — (16)

MONITOR POINT NUMBER G106 (17) (20) DATE COLLECTED 031181 (21) (26)

ST. CLAIR Co. – LPC REGION 5 (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 8:08 a.m. Unable to collect sample (X) (30)

Stick-up 02.2 ft. (31) (33) Depth to water 17.1 ft. (from T.O.C.) (34) (36)

Sample temp. (37) — ° (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: BLACK & DIRTY

Collector comments: REMOVED ONE VOLUME 3-10-81; FILTERED SAMPLES EXCEPT OIL & GREASE

KEN BODE & DOUG TOLAN — DLPC
Collected by — Div. or Company

KEN BODE & DOUG TOLAN — DLPC
Transported by — Div. or Company

LAB USE ONLY

Lab No. BU43546

Date Rec'd MAR 11 1981

Rec'd by [illegible] Time 5 a.m. p.m.

Sample temp acceptable YES NO

Sample properly preserved YES NO

Date completed

Date forwarded MAR 30 1981

Supervisor Signature

Name
Address of Lab

LPCSM020
Lab Comments:

(27) — — — — — — — — (36)

(37) — — — — — — — — (46)

(47) — — — — — — — — (56)

(57) — — — — — — — — (66)

(67) — — — — — — — — (76)

Private Lab (X) (77)

IEPA Lab (X) (78)

LPCSM030

	Parameters[1]	ppm
27	X Alkalinity[1]	594
31	X Ammonia as N	3.0
37	X Arsenic As	0.085
44	X Barium Ba	0.3
49	X BOD	19
53	X Boron B	0.5
58	X Cadmium Cd	0.010
64	X Calcium Ca	175.
69	X COD	146
73	X Chloride Cl	150

LPCSM040

27	X Chromium Cr (tot)	0.00
33	Chromium Cr^{+6}	
39	X Copper Cu	0.01
45	X Cyanide CN	0.00
52	Fecal Coli	
56	X Fluoride F	0.7
61	X Hardness $CaCO_3$	615
65	X Iron Fe	4.9
70	X Lead Pb	0.06

LPCSM050

27	X Magnesium Mg	44.8
32	X Manganese Mn	1.62
38	X Mercury Hg	0.0001
45	X Nickel Ni	0.0
51	X Nitrate-nitrite N	0.0
56	X Oil and Grease	2.
60	X pH (Units)	6.7
63	X Phenolics	0.000
70	X Phosphorus P	1.5
75	X Potassium K	5.7

LPCSM060

27	X T.D.S. (180°C)	1100
31	X Selenium Se	0.000
36	X Silver Ag	0.01
44	X Sodium Na	92.6
49	X SC (umhos/cm)	1220
53	X Sulfate SO_4	146.
58	X Zinc Zn	0.1
63	X SULFIDE	0.00

* Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000822

LPC-8 REV. 7/77

CER 051864

WL2

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or Seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

MONITOR WELL
Name (Private Well, Stream, Spring, Impounded Water only)

LPCSMOIO (1) (3) SITE INVENTORY NUMBER (5) (16)

MONITOR POINT NUMBER G101 (17) (20) DATE COLLECTED 031181 (21) (26)

ST. CLAIR Co. - LPC REGION 5 (27)

CAHOKIA / DEAD CREEK
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 7:23 p.m. Unable to collect sample (X) (30)

Stick-up ___ ft. (31) (33) Depth to water 09.8 ft. (from T.O.C.) (34) (36)

Sample temp. ___° (37) (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ______ 2 (41)

Sample Appearance: ______

T.D.W. - 25

Collector comments: REMOVED ONE VOLUME 3-10-81
FILTERED SAMPLES EXCEPT OIL & GRSE.

KEN BOSIE & DOUG TOLAN DLPC
Collected by Div. or Company
KEN BOSIE & DOUG TOLAN DLPC
Transported by Div. or Company

LAB USE ONLY
Lab No. B043541
Date Rec'd MAR 11 1981
Rec'd by JO Time 5 p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded MAR 30 1981

Supervisor Signature
Name
Address of Lab
CHAMPAIGN

LPC3M020
Lab Comments:
(27) (36)
(37) (46)
(47) (56)
(57) (66)
(67) (76)
Private Lab (X) (77)
IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

LPC-8 REV 7/77

LPC3M020

	PARAMETERS*	mg/l
27	X Alkalinity[1]	703
31	X Ammonia as N	0.2
37	X Arsenic As	0.001
44	X Barium Ba	0.0
49	X BOD 5	1
53	X Boron B	0.2
58	X Cadmium Cd	0.00
64	X Calcium Ca	154.
69	X COD	10
73	X Chloride Cl	16

27	X Chromium Cr (tot)	0.00
33	Chromium Cr[+6]	
39	X Copper Cu	0.04
45	X Cyanide CN	0.00
52	Fecal Coli (#/100 ml)	
56	X Fluoride F	0.5
61	X Hardness (CaCO3)	542
65	X Iron Fe	0.3
70	X Lead Pb	0.0

27	X Magnesium Mg	34.2
32	X Manganese Mn	2.00
38	X Mercury Hg	0.0001
45	X Nickel Ni	0.0
51	X Nitrate-nitrite N	0.0
56	X Oil and Grease	1
60	X pH (Units)	6.9
63	X Phenolics	0.000
70	X Phosphorus P	0.06
75	X Potassium K	4.0

27	X R.O.E. (180°C)	676
31	X Selenium Se	0.000
38	X Silver Ag	0.01
44	X Sodium Na	11.0
49	X SC (umhos/cm)	1050
53	X Sulfate SO_4	118
58	X Zinc Zn	0.1
63	X SULFIDE	0.00

[1]Alkalinity is to be determined as mg/l of $CaCO_3$ at pH 4.5.

E000823

CER 051865

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

MONITOR WELL
Name (Private Well, Stream, Spring, Impounded Water only)

L P C S M 0 1 0 (1) (8) SITE INVENTORY NUMBER (9) — (16)

MONITOR POINT NUMBER G102 (17) (20) DATE COLLECTED 031081 (21) (26)

ST. CLAIR Co. - LPC REGION S (27)

CAHOKIA / DEAD CREEK
(Location) (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 3:50 pm Unable to collect sample (X) (30)

Stick-up 0.0 ft. (31) (33) Depth to water 17.8 ft. (from T.O.C.) (34) (36)

Sample temp. (37) ° (39) Background (X) (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: T.D.W. - 30°

Collector comments: REMOVED ONE VOLUME; FILTERED SAMPLES EXCEPT OIL & GRSE.

KEN BOSIE & DOUG TOLAN DLPC
Collected by Div. or Company

KEN BOSIE & DOUG TOLAN DLPC
Transported by Div. or Company

LAB USE ONLY
Lab No. BU43542
Date Rec'd MAR 11 1981
Rec'd by [illegible] Time 5 p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded MAR 30 1981

Supervisor Signature

Name
Address
of Lab

LPCSM020
Lab Comments:

(27) — (36)

(37) — (46)

(27) — (36)

(37) — (66)

(67) — (76)

Private Lab (X) (77)

IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

LPC-8 REV. 7/77

LPCSM030

		PARAMETERS	
27	X	Alkalinity[1]	969
31	X	Ammonia as N	0.0
37	X	Arsenic As	.2000
44	X	Barium Ba	0.2
49	X	BOD 5	1
53	X	Boron B	2.4
58	X	Cadmium Cd	0.01
64	X	Calcium Ca	333.
69	X	COD	24
73	X	Chloride Cl	12.4

LPCSM040

27	X	Chromium Cr (tot)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.06
45	X	Cyanide CN	0.00
52		Fecal Coli (/100 ml)	
56	X	Fluoride F	0.7
61	X	Hardness CaCO3	1062
65	X	Iron Fe	0.3
70	X	Lead Pb	0.0

LPCSM050

27	X	Magnesium Mg	77.9
32	X	Manganese Mn	2.98
38	X	Mercury Hg	0.0001
45	X	Nickel Ni	0.3
51	X	Nitrate-nitrite N	1.1
56	X	Oil and Grease	1
60	X	pH (Units)	6.8
63	X	Phenolics	0.000
70	X	Phosphorus P	0.01
75	X	Potassium K	10.8

LPCSM060

27	X	R.O.E. (180°C)	1660
31	X	Selenium Se	0.000
38	X	Silver Ag	0.00
44	X	Sodium Na	64.0
49	X	SC (umhos/cm)	2120
53	X	Sulfate SO_4	617.
58	X	Zinc Zn	0.8
63	X	SULFIDE	0.02

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

CER 051866

E000824

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name MONITOR WELL (Private Well, Stream, Spring, Impounded Water only)

LPCSMD10 (1)-(8) SITE INVENTORY NUMBER (9)-(26)

MONITOR POINT NUMBER G103 (17)-(20) DATE COLLECTED 031081 (21)-(26)

ST. CLAIR Co. - LPC REGION 5 (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 3:31 p.m. Unable to collect sample (X) (30)

Stick-up 00.8 ft. (31)-(33) Depth to water 17.0 ft. (from T.O.C.) (34)-(36)

Sample temp. (37)-(39) ° Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance: T.D.W. - 31°

Collector comments: REMOVED ONE VOLUME. FILTERED SAMPLES EXCEPT OIL + GRSE.

KEN BOSIE + DOUG TOLAN — DLPC
Collected by — Div. or Company

KEN BOSIE + DOUG TOLAN — DLPC
Transported by — Div. or Company

LAB USE ONLY

Lab No. BU43543

Date Rec'd MAR 11 1981

Rec'd by [illegible] Time 5 a.m. p.m.

Sample temp. acceptable YES NO

Sample properly preserved YES NO

Date completed

Date Forwarded MAR 30 1981

Supervisor Signature

Name
Address
of Lab

LPCSMD20
Lab Comments:

(27) — (36)
(37) — (46)
(27) — (36)
(37) — (66)
(67) — (76)

Private Lab (X) (77)
IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should be explained in the lab comments section.

LPCSMD30

		PARAMETERS	PPM
27	X	Alkalinity[1]	319
31	X	Ammonia as N	1.5
37	X	Arsenic As	0.003
44	X	Barium Ba	0.1
49	X	BOD	1
53	X	Boron B	0.3
58	X	Cadmium Cd	0.01
64	X	Calcium Ca	161
69	X	COD	47
73	X	Chloride Cl	46

LPCSMD40

27	X	Chromium Cr (total)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.08
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	X	Fluoride F	0.8
61	X	Hardness CaCO3	620
65	X	Iron Fe	1.6
70	X	Lead Pb	0.0

27	X	Magnesium Mg	41.9
32	X	Manganese Mn	3.51
38	X	Mercury Hg	0.0001
46	X	Nickel Ni	1.1
51	X	Nitrate-nitrite N	0.0
56	X	Oil and Grease	0
60	X	pH (Units)	6.8
63	X	Phenolics	0.005
70	X	Phosphorus P	0.03
75	X	Potassium K	10.4

27	X	[illegible]	1070
31	X	Selenium Se	0.001
38	X	Silver Ag	0.00
44	X	Sodium Na	65.6
49	X	SC (umhos/cm)	1470
53	X	Sulfate SO4	427
58	X	Zinc Zn	2.8
63	X	SULFIDE	0.00

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

E000825

CER 051867

LPC 8 REV 7/77

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name MONITOR WELL (Private Well, Stream, Spring, Impounded Water only)

LPCSM010 SITE INVENTORY NUMBER (1) (3) (4) — — — — — — — — (26)

MONITOR POINT NUMBER G104 (20) DATE COLLECTED 031081 (21) (26)

ST. CLAIR Co. - LPC REGION 5 (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 4:20 a.m. p.m. Unable to collect sample (X) (30)

Stick-up 017 ft. (31) (33) Depth to water 199 ft. (from T.O.C.) (34) (36)

Sample temp. ° (37) (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) 2 (41)

Sample Appearance:

T.D.W. - 281

Collector comments: REMOVED ONE VOLUME; FILTERED SAMPLES EXCEPT OIL & GRSE.

KEN BOSIE & DOUG TOLAN DLPC
Collected by / Div. or Company

KEN BOSIE & DOUG TOLAN DLPC
Transported by / Div. or Company

LAB USE ONLY

Lab No. BU43544

Date Rec'd MAR 11 1981

Rec'd by [signature] Time 5 a.m. p.m.

Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded MAR 30 1981

Supervisor Signature

Name
Address
of Lab

LPCSM020
Lab Comments:

(27) — — — — — — — — (36)
(37) — — — — — — — — (46)
(47) — — — — — — — — (56)
(57) — — — — — — — — (66)
(67) — — — — — — — — (76)

Private Lab (X) (77)
IEPA Lab (X) (78)

	LPCSM030 PARAMETERS*	ppm
27	X Alkalinity[1]	568
31	X Ammonia as N	0.0
37	X Arsenic As	0.001
44	X Barium Ba	0.2
49	X BOD -5	1
53	X Boron B	0.7
58	X Cadmium Cd	0.00
64	X Calcium Ca	205
69	X COD	9
73	X Chloride Cl	28

	LPCSM040	
27	X Chromium Cr (tot)	0.01
33	Chromium Cr+6	
39	X Copper Cu	0.02
45	X Cyanide CN	0.01
52	Fecal Coli	
56	X Fluoride F	0.3
61	X Hardness (CaCO3)	839
65	X Iron Fe	0.0
70	X Lead Pb	0.0

	LPCSM050	
27	X Magnesium Mg	56.8
32	X Manganese Mn	0.61
38	X Mercury Hg	0.0001
46	X Nickel Ni	0.0
51	X Nitrate-nitrite N	23
56	X Oil and Grease	2
60	X pH (Units)	6.9
63	X Phenolics	0.000
70	X Phosphorus P	0.02
75	X Potassium K	5.9

	LPCSM060	
27	X R.O.E. (180°C)	1200
31	X Selenium Se	0.003
38	X Silver Ag	0.00
44	X Sodium Na	17.4
49	X SC (umhos/cm)	1550
53	X Sulfate SO_4	303
58	X Zinc Zn	0.1
63	X SULFIDE	0.02

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

CER 051868

E000826

LPC-8 REV. 7/77

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only): Monitor Well

L P C S M 0 1 0 (1) (8) SITE INVENTORY NUMBER (9) ______ (16)

MONITOR POINT NUMBER (17) G105 (20) DATE COLLECTED (21) 031081 (26)

ST. CLAIR Co. - LPC REGION 5 (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 2:58 p.m. Unable to collect sample (X) (30)

Stick-up 01.2 ft. (31) (33) Depth to water 161 ft. (from T.O.C.) (34) (36)

Sample temp. ° (37) (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ______ 2 (41)

Sample Appearance: T.D.W. - 30º

Collector comments: REMOVED ONE VOLUME; FILTERED SAMPLES EXCEPT OIL & GRESE.

KEN BOSIE & DOUG TOLAN — DLPC
Collected by — Div. or Company

KEN BOSIE & DOUG TOLAN — DLPC
Transported by — Div. or Company

LAB USE ONLY

Lab No. BU43545

Date Rec'd MAR 11 1981

Rec'd by [initials] Time 5 p.m.

Sample temp acceptable YES NO

Sample properly preserved YES NO

Date completed MAR 30 1981

Date forwarded

Supervisor Signature

Name
Address
of Lab

LPCSM020
Lab Comments:

(27) ______ (36)
(37) ______ (46)
(47) ______ (56)
(57) ______ (66)
(67) ______ (76)

Private Lab (X) (77)
IEPA Lab (X) (78)

LPCSM010

		PARAMETERS	mg/l
27	X	Alkalinity[1]	393
31	X	Ammonia as N	0.4
37	X	Arsenic As	0.013
42	X	Barium Ba	0.2
49	X	BOD 5	2
53	X	Boron B	0.3
58	X	Cadmium Cd	0.00
64	X	Calcium Ca	218.
69	X	COD	23
73	X	Chloride Cl	57

LPCSM020

27	X	Chromium Cr (total)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.02
45	X	Cyanide CN	0.00
52		Fecal Coli (#/100 ml)	
56	X	Fluoride F	0.6
61	X	Hardness CaCO3	796
65	X	Iron Fe	9.4
70	X	Lead Pb	0.0

27	X	Magnesium Mg	47.0
32	X	Manganese Mn	2.32
38	X	Mercury Hg	0.0001
45	X	Nickel Ni	0.2
51	X	Nitrate-nitrite N	0.0
56	X	Oil and Grease	2
60	X	pH (Units)	6.2
63	X	Phenolics	0.000
70	X	Phosphorus P	0.10
75	X	Potassium K	8.9

27	X	R.O.E. (180°C)	1090
31	X	Selenium Se	0.000
36	X	Silver Ag	0.02
44	X	Sodium Na	51.2
49	X	SC (umhos/cm)	1610
53	X	Sulfate SO4	466.
59	X	Zinc Zn	0.3
63	X	SULFIDE	0.00

[1] Alkalinity is to be determined as mg/l CaCO3 at pH 4.5.

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

E000827

CER 051869

LPC 2 REV. 7/77

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Runoff	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name: Moniter Well (Private well, Stream, Spring, Impounded Water only)

L P C S M 0 1 0 (1)(7) SITE INVENTORY NUMBER (7)———(16)

MONITOR POINT NUMBER G108 (17)(20) DATE COLLECTED 031081 (21)(26)

St Clair Co. - LPC REGION 5 (27)

Cahukia (Location) / Dead Creek (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 Board Order (X) (29)

Time Collected 12:58 p.m. Unable to collect sample (X) (30)

Stick-up ___ ft. (31)(33) Depth to water 159 ft. (from T.O.C.) (34)(36)

Sample temp. ___ ° (37)(39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ______ 2 (41)

Sample Appearance: ______

TDW-342

Collector comments: Removed One Volume; Filtered Samples except Oil + Grse.

Ken Bosie + Doug Tolan — DLPC
Collected by — Div. or Company

Ken Bosie + Doug Tolan — DLPC
Transported by — Div. or Company

LAB USE ONLY BU43548

Lab No. ______

Date Rec'd MAR 11 1981

Rec'd by [illegible] Time 5 a.m./p.m.

Sample temp. acceptable YES NO

Sample properly preserved YES NO

Date completed

Date forwarded MAR 30 1981

Supervisor Signature

Name
Address
of Lab

CHAMPAIGN

LPCSM020
Lab Comments:

(27)———(36)

(37)———(46)

(27)———(36)

(37)———(66)

(67)———(76)

Private Lab (X) (77)

IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

LPC 8 REV. 7/77

		PARAMETERS	
27	X	Alkalinity[1]	464
31	X	Ammonia as N	0.2
37	X	Arsenic As	0.001
44	X	Barium Ba	0.2
49	X	BOD -5	1
53	X	Boron B	0.2
59	X	Cadmium Cd	0.00
64	X	Calcium Ca	148.
69	X	COD	12
73	X	Chloride Cl	51

27	X	Chromium Cr (Tot)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.03
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	X	Fluoride F	0.3
61	X	Hardness CaCO3	479
65	X	Iron Fe	0.0
70	X	Lead Pb	0.0

27	X	Magnesium Mg	22.3
32	X	Manganese Mn	0.23
38	X	Mercury Hg	0.0001
45	X	Nickel Ni	0.1
51	X	Nitrate-nitrite N	0.1
56	X	Oil and Grease	1
60	X	pH (Units)	7.0
63	X	Phenolics	0.100
70	X	Phosphorus P	0.02
75	X	Potassium K	18.2

27	X	[illegible]	650
31	X	Selenium Se	0.001
38	X	Silver Ag	0.00
44	X	Sodium Na	25.2
49	X	SC (umhos/cm)	1060
53	X	Sulfate SO4	55
58	X	Zinc Zn	0.3
63	X	SULFIDE	0.07

[1]Alkalinity is to be determined as ppm of CaCO3 at pH 4.5.

E000825

CER 051870

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	(X) Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Run-off	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water only) Monitor Well

L P C S M 0 1 0 (1) (8) SITE INVENTORY NUMBER (9) (16)

MONITOR POINT NUMBER G110 (17) (20) DATE COLLECTED 031081 (21) (26)

St. Clair Co. - LPC REGION 5 (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 2:15 p.m. Unable to collect sample (X) (30)

Stick-up ___ ft. (31) (33) Depth to water 163 ft. (from T.O.C.) (34) (36)

Sample temp. ___ ° (37) (39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ___ 2 (41)

Sample Appearance: T.D.W. - 198

Collector comments: REMOVED ONE VOLUME; FILTERED SAMPLES EXCEPT OIL + GRSE.

KEN BOSIE + DOUG TOLAN DLPC
Collected by Div. or Company

KEN BOSIE + DOUG TOLAN DLPC
Transported by Div. or Company

LAB USE ONLY

Lab No. BU43550

Date Rec'd MAR 11 1981

Rec'd by [illegible] Time 5 p.m.

Sample temp. acceptable YES NO

Sample properly preserved YES NO

Date completed/forwarded MAR 30 1981

Supervisor Signature CHASTRAUCH

Name
Address of Lab

LPCSM020
Lab Comments:

(27) ---------- (36)
(37) ---------- (46)
(47) ---------- (56)
(57) ---------- (66)
(67) ---------- (76)

Private Lab (X) (77)
IEPA Lab (X) (78)

	PARAMETER[1]	
27	Alkalinity	33L
31	Ammonia as N	0.2
37	Arsenic As	0.001
44	Barium Ba	0.1
49	BOD	1
53	Boron B	0.1
58	Cadmium Cd	0.0014
64	Calcium Ca	121.
69	COD	10
73	Chloride Cl	27

	PARAMETER	
27	Chromium Cr (total)	0.00
33	Chromium Cr hex	
39	Copper Cu	0.02
45	Cyanide CN	0.00
52	Fecal Coli	
56	Fluoride F	0.7
61	Hardness CaCO3	424
65	Iron Fe	0.0
70	Lead Pb	0.0

	PARAMETER	
27	Magnesium Mg	28.7
32	Manganese Mn	0.14
38	Mercury Hg	0.0001
45	Nickel Ni	1.2
51	Nitrate-nitrite N	15
56	Oil and Grease	1
60	pH (Units)	6.6
63	Phenols	0.000
70	Phosphorus P	0.01
75	Potassium K	6.3

	PARAMETER	
27	T.D.S. (180°C)	558
31	Selenium Se	0.018
37	Silver Ag	0.01
44	Sodium Na	14.2
49	SC (umhos/cm)	920
53	Sulfate SO_4	41
58	Zinc Zn	1.8
63	SULFIDE	0.0

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

LPC-8 REV. 7/77

CER 051871

E000829

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water	(G) Ground Water	(L) Leachate	X Special
(1) Upstream	(1) Monitor Well	(1) Flow or seep	(1) Soil
(2) Mid-site	(2) Private well	(2) Pond	(2) Waste
(3) Downstream	(3) Spring	(3) Collection System	(3) Other
(4) Runoff	(4) Lysimeter		
(5) Impounded	(5) Public W S		

Name (Private Well, Stream, Spring, Impounded Water Only): Monitor Well

L P C S M 0 1 0 (1)–(8) SITE INVENTORY NUMBER (9)–(16)

MONITOR POINT NUMBER (17)–(20): G111 DATE COLLECTED (21)–(26): 031081

St. Clair Co. - LPC REGION (27): 5

Cahokia (Location) / Dead Creek (Responsible Party)

Legal (1); Illegal (2); Indicate One: 2 (28) Board Order (X) (29)

Time Collected 1:34 p.m. Unable to collect sample (X) (30)

Stick-up ___ ft. (31)–(33) Depth to water 180 ft. (from T.O.C.) (34)–(36)

Sample temp. ___ ° (37)–(39) Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ______ 2 (41)

Sample Appearance:

T.D.W. - 30³

Collector comments: REMOVED ONE VOLUME; FILTERED SAMPLES EXCEPT OIL + GRSE.

KEN BOSIE + DOUG TOLAN DLPC
Collected by Div. or Company

KEN BOSIE + DOUG TOLAN DLPC
Transported by Div. or Company

LAB USE ONLY

Lab No. BU43551.

Date Rec'd MAR 11 1981 11 1981

Rec'd by [signature] Time 5 a.m. p.m.

Sample temp. acceptable YES NO

Sample properly preserved YES NO

Date completed/forwarded MAR 30 1981

Supervisor Signature

Name
Address
of Lab

LPCSM020
Lab Comments:

(37)–(36)
(37)–(46)
(47)–(56)
(57)–(66)
(67)–(76)

Private Lab (X) (77)
IEPA Lab (X) (78)

	PARAMETERS		Units
27	X	Alkalinity¹	381
31	X	Ammonia as N	5.1
37	X	Arsenic As	0.001
44	X	Barium Ba	0.1
49	X	BOD	1
53	X	Boron B	2.4
58	X	Cadmium Cd	0.00
64	X	Calcium Ca	164.
69	X	COD	9
73	X	Chloride Cl	16

27	X	Chromium Cr (total)	0.00
33		Chromium Cr⁺⁶	
39	X	Copper Cu	0.07
45	X	Cyanide CN	0.00
52		Fecal Coli (#/100 ml)	
56	X	Fluoride F	0.5
61	X	Hardness CaCO₃	485
65	X	Iron Fe	0.2
70	X	Lead Pb	0.07

27	X	Magnesium Mg	31.8
32	X	Manganese Mn	1.02
38	X	Mercury Hg	0.0001
45	X	Nickel Ni	0.0
51	X	Nitrate-nitrite N	2.7
56	X	Oil and Grease	1
60	X	pH (Units)	6.7
63	X	Phenolics	0.000
70	X	Phosphorus P	0.01
76	X	Potassium K	2.9

27	X	T.D.S.	656
31	X	Selenium Se	0.001
38	X	Silver Ag	0.01
44	X	Sodium Na	155
49	X	SC (umhos/cm)	990
53	X	Sulfate SO₄	147
58	X	Zinc Zn	0.1
63	X	SULFIDE	0.00

¹Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

CER 051872

E000830

LPC-6 REV. 7/77

WE-2

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point

(S) Surface Water — (1) Upstream; (2) Mid-site; (3) Downstream; (4) Run-off; (5) Impounded
(G) Ground Water — (1) Monitor Well; (2) Private well; (3) Spring; (4) Lysimeter; (5) Public W S
(L) Leachate — (1) Flow or seep; (2) Pond; (3) Collection System
(X) Special — (1) Soil; (2) Waste; (3) Other

Name (Private Well, Stream, Spring, Impounded Water only): Moniter Well

LPCGM010 (2)–(9)

SITE INVENTORY NUMBER (5) — (16)

MONITOR POINT NUMBER (17) G112 (20)

DATE COLLECTED (21) 031081 (26)

St Clair Co. - LPC REGION S (27)

CAHOKIA (Location) / DEAD CREEK (Responsible Party)

Legal (1); Illegal (2): Indicate One: 2 (28)   Board Order (X) (29)

Time Collected 11:23 a.m./p.m.   Unable to collect sample (X) (30)

Stick-up (31)–(33) ft.   Depth to water 18.7 ft. (from T.O.C.) (34) (36)

Sample temp. (37)–(39) °   Background (X). . . . (40)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify) ______ 2 (41)

Sample Appearance: SILTY + DIRTY
T.D.W. - 35² (CERRO COPPER PROP.)

Collector comments: NO ODOR; ONE VOLUME RE-MOVED; FILTERED SAMPLES EXCEPT OIL + GREASE

KEN BOSIE + DOUG TOLAN — DLPC
Collected by — Div. or Company

KEN BOSIE + DOUG TOLAN — DLPC
Transported by — Div. or Company

LAB USE ONLY
Lab No. B043552
Date Rec'd MAR 11 1981
Rec'd by [initials] Time 5 a.m./p.m.
Sample temp. acceptable YES NO
Sample properly preserved YES NO
Date completed
Date forwarded MAR 30 1981

Supervisor Signature

Name
Address of Lab
CHAMPAIGN

LPCGM020
Lab Comments:
(27) — (36)
(37) — (46)
(47) — (56)
(57) — (66)
(67) — (76)
Private Lab (X) (77)
IEPA Lab (X) (78)

*Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

LPCGM030

	PARAMETERS	ppm
27	X Alkalinity[1]	400
31	X Ammonia as N	0.7
37	X Arsenic As	0.003
44	X Barium Ba	0.0
49	X BOD	10
53	X Boron B	3.4
58	X Cadmium Cd	0.157
64	X Calcium Ca	207.
69	X COD	52
73	X Chloride Cl	133

LPCGM040

27	X Chromium Cr (tot)	0.00
33	Chromium Cr+6	
39	X Copper Cu	0.48
45	X Cyanide CN	0.02
52	Fecal Coli	
56	X Fluoride F	0.8
61	X Hardness CaCO3	789
65	X Iron Fe	0.5
70	X Lead Pb	0.0

	X Magnesium Mg	72.0
32	X Manganese Mn	2.10
38	X Mercury Hg	0.0001
46	X Nickel Ni	0.4
51	X Nitrate-nitrite N	0.2
56	X Oil and Grease	1
60	X pH (Units)	6.6
63	X Phenolics	0.005
70	X Phosphorus P	0.03
75	X Potassium K	40.2

27	X [illegible]	1530
31	X Selenium Se	0.000
38	X Silver Ag	0.01
44	X Sodium Na	96.6
49	X SC (umhos/cm)	2040
53	X Sulfate SO4	544.
58	X Zinc Zn	11.8
63	X SULFIDE	0.02

[1] Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

LPC-8 REV. 7/77

CER 051873

E000831

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

MEMORANDUM

DATE: February 22, 1983

TO: Division File

FROM: Tom Powell - Southern Region

SUBJECT: LPC - General - St. Clair County - Cahokia/Dead Creek

On February 14, 1983, William DeLisle, 130 Edwards Place, Cahokia, Illinois (618)337-2171 phoned the Division of Water Pollution Control, Region 6, to report that substantial quantities of water are seeping into his basement. Mr. DeLisle reported that the water has an orange chemical looking substance in it, as well as a black tar-looking material upon the surface. Mr. DeLisle, worried about the recent reports of dioxin in the Dead Creek area and with the water seeping into his basement, wanted IEPA to sample to determine if any contaminants from Dead Creek are entering his basement. Since the Division of Land Pollution Control has been involved in the Dead Creek investigation, this information was forwarded to DLPC for consideration.

Attempts to contact Mr. DeLisle were not successful until he contacted this office on February 16, 1983. In speaking to Mr. DeLisle, this writer told him that a representative of the DLPC would be out to his residence the following morning to obtain water samples from his basement.

This writer arrived at Mr. DeLisle's residence at 10:00 a.m. on February 17, 1983 and as stated previously, Mr. DeLisle was concerned with the recent press reports that dioxin has been found in Dead Creek. Since his residence is approximately 200 yards east of the creek, he wanted samples taken from within his basement. The basement, constructed of concrete block walls with a poured concrete floor had approximately 3-4 inches of very fine grained grey sand over most of the floor. The water sample point for the organics, inorganics and volitiles were taken from the foot of the basement stairs, while the sediment sample for organics was taken from the southwest corner of the basement. The southwest corner was where the orange and black tar-looking stains were observed upon the sand. It is felt, by this writer, that these stains are from the leaching of the black tar material used to seal basements against water leakage. The orange material appears to be rust, however it is not known where this material could be coming from, although metal sheets used possibly as forms in the construction of the house were noted outside of the house's foundation.

Mr. DeLisle was told that it would be several weeks before test results were finished, and at that time he would be notified of the results. After obtaining the samples, this writer departed from the site.

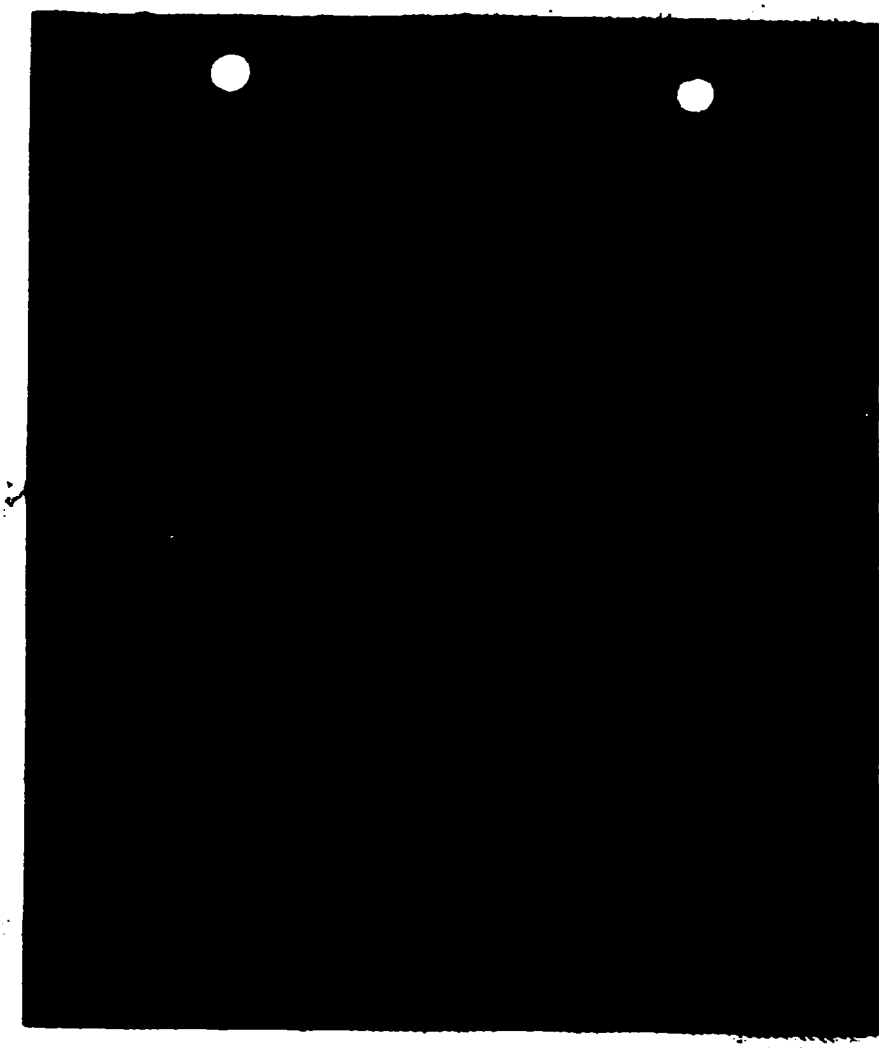
TEP:jlr

cc: Southern Region

CER 051874

E000832

IL 532-0670



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Type of Monitoring Point

Surface Water | Ground Water | Leachate | X Special

Upstream | Monitor Well | Flow or Lend | Soil
Mid-site | Private Well | Pond | Waste
Downstream | Spring | Collection System | Other
Runoff | Lysimeter | |
Impounded | (5) Public W S | |

X-301 [illegible]

Monitor Point No. X-301 | Date Collected 032283 (26)

Facility — LPC | REGION 5 (27)

[illegible] | Dead Creek
Location | Responsible Party

Board Order (X) (29)

Time Collected 10:30 [illegible] (30)

Depth to Water from T.O.C. (36)

Sample Temp. | Background (X) (40)

Ground Water Sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (specify) [illegible] (41)

Sample Appearance: slightly turbid - slight odor

Collector comments: Sample collected at foot of [illegible] [illegible] water flowing [illegible]

[illegible] | D.L.P.C.
Collected by | Div. or Company

Transported by | Div. or Company

LAB USE ONLY [illegible]

Lab No.

Date Rec'd [illegible]

Rec'd by AR Time 11:30 a.m.

Sample temp. acceptable YES NO
Properly preserved YES NO

Date Completed
Date Forwarded MAY 2 1983

CHAMPAIGN

Supervisor Signature

Name
Address of Lab

LPCSM020
Lab Comments:
* Sample discarded (30) before analysis (37) (36)
*t SAMPLE DISCARDED (56) BEFORE ANALYSIS (66)

(67
Private Lab (X)
IEPA Lab (X) (77)

RECEIVED
MAY 1 8 1983
ILL. E.P.A. — D.L.P.C.
STATE OF ILLINOIS

		PARAMETER	mg/l
27	X	[illegible]	520
31	X	Ammonia N	0 0
37	X	Arsenic As	0 005
44	X	Barium	0 3
49	X	Boron	0
53	X	[illegible]	0 2
60	X	Cadmium	0 00
64	X	[illegible]	190
69	X	[illegible]	[illegible]
73	X	Chloride Cl	[illegible]
27	X	Chromium [illegible]	0 0
33		Chromium [illegible]	
37	X	Copper	0 02
45	X	Cyanide	[illegible]
52		[illegible]	
56		Fluoride F	
61	X	Hardness	730
65	X	Iron Fe	3.0
70	X	Lead	0 0
27	X	[illegible]	51
32	X	Manganese Mn	0 60
38	X	Mercury Hg	0 0001
45	X	Nickel Ni	0 0
51	X	Nitrate-nitrite	0 2
56		Oil and Grease	
60	X	pH (Units)	7
63		[illegible]	[illegible]
70	X	Phosphorus P	0 59
75	X	Potassium	[illegible]
	X		*
50		[illegible] Ag	
44	X	Sodium Na	*+
		[illegible]	
49	X	Sulfate SO4	51
56	X	[illegible]	0 1
63		[illegible]	[illegible]

* Analyses must be performed on unfiltered samples. Values exceeding [illegible] places shown are reported in the lab comments section. Tests requested but not run should also be explained in the lab comments section.

CER 051876

E000834

[redacted]

CER 051877

E000835

DIVISION OF LAND [illegible] POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

Jewry

(S) Surface Water | Ground Water | Leachate | X Special
1 Upstream | Monitor Well | Tile or Seep | Soil
2 Mid-site | (2) Private well | Pond | 2 Waste
3 Downstream | Spring | Collection System | (3) Other
4 Run-off | Lysimeter | |
5 Impounded | (5) Public W S | |

EPA - DLPC
STATE OF ILLINOIS

Name: Deadcreek - South of Judith St - Culvert under road

Type of Analysis: General

Monitor Point Number: S301 | Date Collected: 010583 (26)

St. Clair | County

Cahokia | Dead Creek

Board Order (X) 2 (29)

Time Collected: 3:20

Stick-up ___ ft.

Sample Temp. ___

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (specify) dip 3 (41)

Sample Appearance: Slightly murky odorless

Collector comments: dip sample from underneath road where culvert discharges

Collected by: Reynolds (?) | Div. or Company: DLPC

Bob Hagele / CMG | Div. or Company

LAB USE ONLY

Lab No.: [illegible]

Date Received: [illegible] 1983

Rec'd by: AK | Time: 11

Champaign RJ

Lab Comments:

Name
Address
of Lab

Private (X)
IEPA Lab (X) X

No.	X	Parameter	Result
27	X	Alkalinity	130
31	X	Ammonia as N	0.0
37	X	Arsenic As	0.004
39	X	Barium Ba	0.1
43	X	[illegible]	
53	X	[illegible]	0.2
56	X	Cadmium	0.00
64	X	Calcium Ca	83
69	X	Iron	32
73	X	Chloride Cl	45

No.	X	Parameter	Result
27	X	Chromium Cr (Tot)	0.00
33		Chromium Cr+6	
39	X	Copper Cu	0.06
45	X	Cyanide CN	0.00
52		Fecal Coli	
56	X	Fluoride F	0.3
61	X	Hardness	[illegible]
65	X	Iron Fe	0.4
70	X	Lead Pb	.00

No.	X	Parameter	Result
27	X	Magnesium Mg	14
32	X	Manganese Mn	0.14
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.1
51	X	Nitrate-nitrite	1.4
56		Oil and Grease	
60	X	pH (Units)	7.3
63	X	Phenol	0.005
70	X	Phosphorus	0.16
7	X	[illegible]	49

No.	X	Parameter	Result
27	X	[illegible]	361
31	X	[illegible]	0.001
	X	[illegible]	0.00
	X	Sodium Na	25
49	X	SC (umhos/cm)	610
53	X	Sulfate SO4	52
58	X	Zinc	0.3
63			

CER 051878

*Analyses [illegible] samples. [illegible] exceeding [illegible] comments section; tests requested [illegible] lab comments [illegible]

KM
TP

*sample 6 days old when received

E000836

DIVISION OF LAND/NOISE POLLUTION CONTROL
CHEMICAL ANALYSIS FORM

RECEIVED
MAR 1983
E.P.A. — D.L.P.C.
STATE OF ILLINOIS

Key for Determining Type of Monitoring Point

S Surface Water	G Ground Water	L Leachate	X Special
1 Upstream	1 Monitor Well	1 Flow or seep	1 Soil
2 Mid-site	2 Private well	2 Pond	2 Waste
3 Downstream	3) Spring	3 Collection System	
4 Run-off	4) Lysimeter		
5 Impounded	(5) Public W/S		

Name: Basement of Batson residence

Site Inventory Number: GENERAL

Monitoring Point Number: X301 | Date Collected: 010583

St. Clair (County) | Region

Cahokia (Location) | Dead Creek (Responsible Party)

Legal (1) Illegal (2) Indicate One: 2 | Board Order (X)

Time Collected: 4:00 p.m. | Split sample (X)

Stick-up ___ ft. | Depth to water ___ ft. (From T.O.C.) | Background (X)

Sample temp. ___

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify): dip — 3

Sample Appearance: turbid - odorless

Collector comments: dip sample from basement of Batson residence - Seepage into basement

Collected by: [signature] — Div. or Company: DLPC

Transported by: Bob Hagele / CMC / SoHl — Div. or Company

LAB USE ONLY

Lab No. ...60200

Date Rec'd: JAN 11 1983

Rec'd by: [initials] Time: 11 am

Lab Comments:

(37) ——— (36)

(57) ——— (66)

(67) ——— (76)

Private Lab (X)

IEPA Lab (X) X (77)

Name / Address of Lab

Supervisor Signature

*Analyses are to be performed on unfiltered samples. †Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

No.		PARAMETERS*	ppm
27	X	Alkalinity†	122
31	X	Ammonia as N	0.0
37	X	Arsenic As	0.017
42	X	Barium Ba	1.1
47	~~X~~	~~BOD~~	
51	X	Boron B	0.3
55	X	Cadmium Cd	0.00
60	X	Calcium Ca	270
67	X	COD	75
73	X	Chloride Cl	70
27	X	Chromium Cr (tot)	0.20
33		Chromium Cr^{+6}	
39	X	Copper Cu	0.08
45	X	Cyanide CN	0.00
52		Fecal Coli (#/100 ml)	
56	X	Fluoride F	0.7
61	X	Hardness $CaCO_3$	232
65	X	Iron Fe	31.0
70	X	Lead Pb	0.08
27	X	Magnesium Mg	54
32	X	Manganese Mn	1.49
38	X	Mercury Hg	0.0000
45	X	Nickel Ni	0.1
51	X	Nitrate-nitrite N	1.3
56		Oil and Grease	
60	X	pH (Units)	7.3
63	X	Phenolics	0.002
70	X	Phosphorus P	1.2
75	X	Potassium K	6.4
27	X	R.O.E. (180°C)	712
31	X	Selenium Se	0.003
37	X	Silver Ag	0.02
44	X	Sodium Na	19
49	X	SC (umhos/cm)	1020
53	X	Sulfate SO_4	99
58	X	Zinc Zn	0.7
63			

†Alkalinity is to be determined as ppm of $CaCO_3$ at pH 4.5.

* sample 6 days old

E000837

LPC-8 Rev.

CER 051879

Sample A

Time Collected: 3:20

Lab # JUN 10 1983

SPECIAL ANALYSIS FORM

Date Collected: 1/5/83

Date Received

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location)

Dip sample from underneath Judith St. where Culvert discharges - on the south side of road.

PHYSICAL OBSERVATIONS, REMARKS:

odorless - slightly murky

TESTS REQUESTED: Organic Scan - Especially PCB's, chlorophenol chlorobenzene, dichlorobenzene, dichlorophenol cyclohexanone chloroaniline

COLLECTED BY: [illegible] IEPA TRANSPORTED BY: Bob Haggle

LABORATORY 27394

RECEIVED BY: C.C. DATE COMPLETED: 2/9/83 DATE FORWARDED: 2/9/83

J. Hurley

PCBs < 0.1 ug/L

Organic compounds (listed above) not detected in the extract of this sample.

RECEIVED
FEB 10 1983
E.P.A. — D.L.P.C.
STATE OF ILLINOIS

CER 051880

LPC-8A 4/77

(NOT FOR DATA PROCESSING)

E000838

Sample

Time Collected: 4:00 P

Lab # 27305

SPECIAL ANALYSIS FORM

Date Collected: 1-5-83

Date Received JAN 10 1983

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia/Dead Creek	General

SOURCE OF SAMPLE: (Exact Location)

Dip sample from basement of Batson residence 102 Walnut St. Cahokia - Sample of water seepage

PHYSICAL OBSERVATIONS, REMARKS:

turbid odorless

TESTS REQUESTED: organic scan - especially, PCB's Chlorophenol Chlorobenzene, Dichlorobenzene, dichlorophenol cyclohexanone, Chloroaniline

COLLECTED BY: [illegible] DLPC TRANSPORTED BY: Bob Hagele

LABORATORY

RECEIVED BY: G. C.

DATE COMPLETED: 2/9/83

DATE FORWARDED: 2/9/83

J Hurley

PCBs < 0.1 ug/l

Chlordane (alpha+gamma) = 0.13 ug/l

Other organics not detected in the extract of this sample

RECEIVED FEB 10 1983 I.E.P.A. - D.L.P.C.

RECEIVED FEB 22 1983 IEPA STATE OF ILLINOIS D.L.P.C.

CER 051881

LPC-8A 4/77

(NOT FOR DATA PROCESSING)

27305

E000839

Time Collected: 3:10 Sample

Date Collected: 1/5/83

SPECIAL ANALYSIS FORM

Lab JAN 10 1983

Date Received

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia / Dead Creek	General

SOURCE OF SAMPLE: (Exact Location)

dip sample from underneath Judith St where culvert discharges - on the south side of road.

PHYSICAL OBSERVATIONS, REMARKS:

odorless - slighty murky

TESTS REQUESTED: Organic Scan - Especially, PCB's, chlorophenol chlorobenzene, dichlorobenzene, dichlorophenol cyclohexanone chloroaniline

COLLECTED BY: [illegible] DLPC TRANSPORTED BY: Bob Hagele

LABORATORY 0027304

RECEIVED BY: J.C. DATE COMPLETED: 2/9/83 DATE FORWARDED: 2/9/83

J Hurley

PCBs < 0.1 ug/L

organic compounds (listed above) not detected in the extract of this sample.

RECEIVED
FEB 14 1983
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

CER 051882

LPC-8A 4/77 (NOT FOR DATA PROCESSING) 0027304

E000840

Time Collected: 4:00 P

Date Collected: 1-5-83

SPECIAL ANALYSIS FORM

Lab

Date Received JAN 10 1983

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF LAND/NOISE POLLUTION CONTROL

COUNTY:	FILE HEADING:	FILE NUMBER:
St. Clair	Cahokia/Dead Creek	General

SOURCE OF SAMPLE: (Exact Location)

Dip sample from basement of Batson residence 102 Walnut St Cahokia - Sample of water seepage

PHYSICAL OBSERVATIONS, REMARKS:

turbid odorless

TESTS REQUESTED: organic scan - especially, PCB's Chlorophenol Chlorobenzene, dichlorobenzene, dichlorophenol cyclohexanone, Chloroaniline

COLLECTED BY: [illegible] · DLPC TRANSPORTED BY: Bob Hagele

LABORATORY

RECEIVED BY: G. C. DATE COMPLETED: 2/7/83 DATE FORWARDED: 2/9/83

PCBs < 0.1 ug/l

Chlordane (alpha+gamma) = 0.13 ug/l

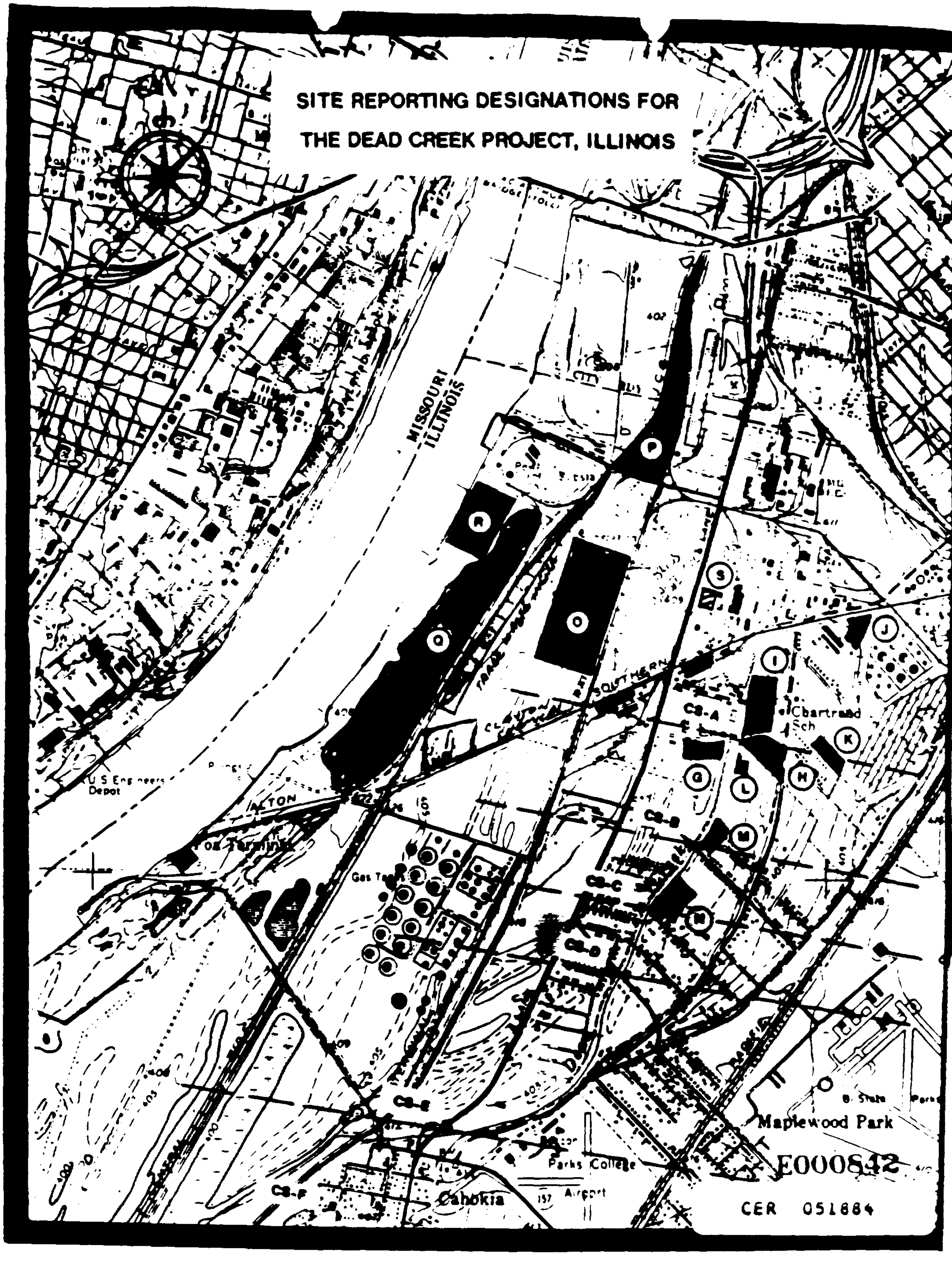
Other organics not detected in the extract of this sample

RECEIVED FEB 14 1983 ILL. E.P.A. - D.L.P.C. STATE OF ILLINOIS

LPC-8A 4/77 (NOT FOR DATA PROCESSING)

CER 051883

E000841


SITE REPORTING DESIGNATIONS FOR
THE DEAD CREEK PROJECT, ILLINOIS
MISSOURI
ILLINOIS
P
R
Q
O
S
J
I
CS-A
Chartrand Sch
K
H
G
L
CS-B
M
CS-C
N
CS-D
CS-E
CS-F
ALTON
SOUTHERN
U S Engineers Depot
Gas Tanks
Maplewood Park
Parks College
Airport
Cahokia
E000842
CER 051884

FIELD PHOTOGRAPHY LOG SHEET

DATE March 23, 1982

TIME 9:10 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, slight wind from S (~5mph), Temp ~50°F

SITE Sauget IL / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY:
Claude E. Mays III

SAMPLE ID# (if applicable)
N/A

Camera: Canon AE-1 w/ Canon FD 50mm F1.8 lens

Picture #12 ~ Corresponds to number on negatives

DESCRIPTION: Looking up (northerly) Dead Creek from Judith Lane towards Monsanto and Cerro Corporation

DATE March 23, 1982

TIME 9:40 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget IL / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY:
Claude E. Mays III

SAMPLE ID# (if applicable)
N/A

Same camera and lens as above

Picture # 13

DESCRIPTION: Eileen Black and April Richards preparing to go on site

CER 051885

E000843

FIELD PHOTOGRAPHY LOG SHEET

Page 2

DATE March 23 1982

TIME 9 50 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny slight wind from S (~5mph) Temp ~50°F

SITE Sauget IL / Dead Creek

TDD# FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Camera Canon AE-1 w/ Canon lens FD 50mm f 1.8

Picture # 14

DESCRIPTION: On-site work crew beginning air monitoring in Dead Creek.

DATE March 23 1982

TIME 9 55 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget IL / Dead Creek

TDD# FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Mays, III

SAMPLE ID# (if applicable)

N/A

Same camera and lens used as above

Picture # 15

DESCRIPTION: Spot # 2 readings at breathing height H-NU (11.7 lamp) 5 ppm and H-NU (10.2 lamp) ~2 ppm

CER 051886

E000844

DATE March 23 1982

TIME 9:56 A.M. P.M.

DIRECTION: N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW

WEATHER Sunny Slight wind from S (~3 mph) Temp ~50°F

SITE Sauget II / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY: Claude E. Mays III

SAMPLE ID# (if applicable) N/A

Camera: Canon AE-1 w/ Canon FD 50mm f1:1.8 lens

Picture #16

DESCRIPTION: Shows lake formed on Walnut Grove Subdivision property by Dead Creek

DATE March 23, 1982

TIME 9:58 A.M. P.M.

DIRECTION: N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY: Claude E. Mays III

SAMPLE ID# (if applicable) N/A

Same camera and lens used as above

Picture #17

CER 051887

DESCRIPTION: Shows spot #3 - readings with H-Nu (11.7 lamp) at breathing region 5ppm

DATE March 23 1982

TIME 10:00 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, slight wind from S (~3mph) Temp ~ 50°F

SITE Sauget, IL / Dead Creek

ID# FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 w/ Canon FD 50mm f1:1.8 lens

Picture #18

DESCRIPTION: Shows groundwater well put in by Ron St. John while working with the Illinois E.P.A. for the Northern Dead Creek Study.

DATE March 23 1982

TIME 10:02 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget, IL / Dead Creek

ID# FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Same Camera and lens as above.

Picture #19

CER 051888

DESCRIPTION: Spot #4 - readings with H-Nu (11.7 lamp) 4 to 5pm

FIELD PHOTOGRAPHY LOG SHEET — Page 5

DATE March 23 1982

TIME 10:05 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, slight wind from S (~5mph) Temp ~50°F

SITE Sauget II / Dead Creek

ID# FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 w Canon FD 50mm F1:1.8 lens

Picture #20

DESCRIPTION: Shows spots #5 & #6 - readings with H-NU (11.7 lamp.) 8 and 7 ppm

---

DATE March 23 1982

TIME 10:10 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

ID# FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Same camera and lens used as above

Picture #21

CER 051889

DESCRIPTION: Shows snow fence (placed there by the IEPA) on far side torn down for easy access to creek.

E000847

FIELD PHOTOGRAPHY LOG SHEET

Page [illegible]

DATE March 23 1982

TIME 10:15 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, slight wind from S (~5mph), Temp ~ 50°F

SITE Sauget II / Dead Creek

TDD# FS-8203-02

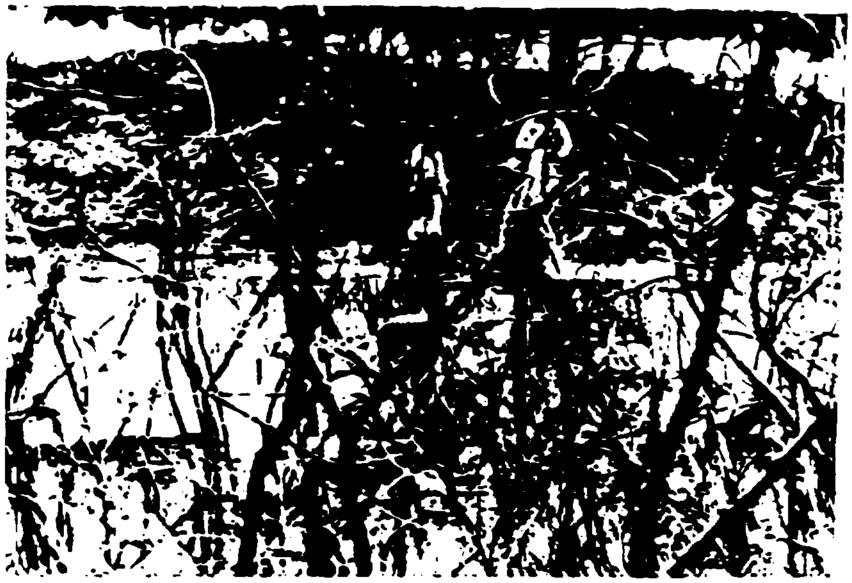
PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 with Canon FD 50mm f1.1.8 lens



Picture # 22

DESCRIPTION: Shows polyethylene acid container in creek.

DATE March 23 1982

TIME 10:30 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Same camera and lens as used above

Picture # 23

DESCRIPTION: Taking sample of seepage and placing it into a [illegible] bottle for later analysis with [illegible] A.

CER 051890

E000848

DATE March 23 1982

TIME 11:40 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny slight wind from S (~5mph) Temp ~50°F

SITE Sauget IL / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY: Charles E Mays III

SAMPLE ID# (if applicable) N/A

Camera Canon AE-1 w/ Canon FD 50mm f1:1.6 Lens

Picture #1

DESCRIPTION: Shows Dead Creek and surrounding areas south of Judith Lane.

DATE March 23 1982

TIME 11:55 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny wind from S-SW @ ~5-10mph, Temp ~60°F

SITE Sauget IL / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY: Don Woods

SAMPLE ID# (if applicable) N/A

Canon AE-1 Camera Zoom - f: 90mm ~ 230mm 1:4.5 Lens

Picture #2

DESCRIPTION: Showing area of seepage near land leased to Ruan Trucking Co.

FIELD PHOTOGRAPHY LOG SHEET

DATE March 23, 1982

TIME 11:56 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, wind from S-SW @ 5-10 mph Temp ~ 60°F

SITE Sauget II / Dead Creek

TDD# FS - 8203 - 02

PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 w/ Zoom f: 90mm ~ 230mm 1:4.5 lens

Picture #3

DESCRIPTION: Area of seepage just south of Cerro Corporation and Queeny Ave in Dead Creek

DATE March 23, 1982

TIME 11:57 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

TDD# FS - 8203 - 02

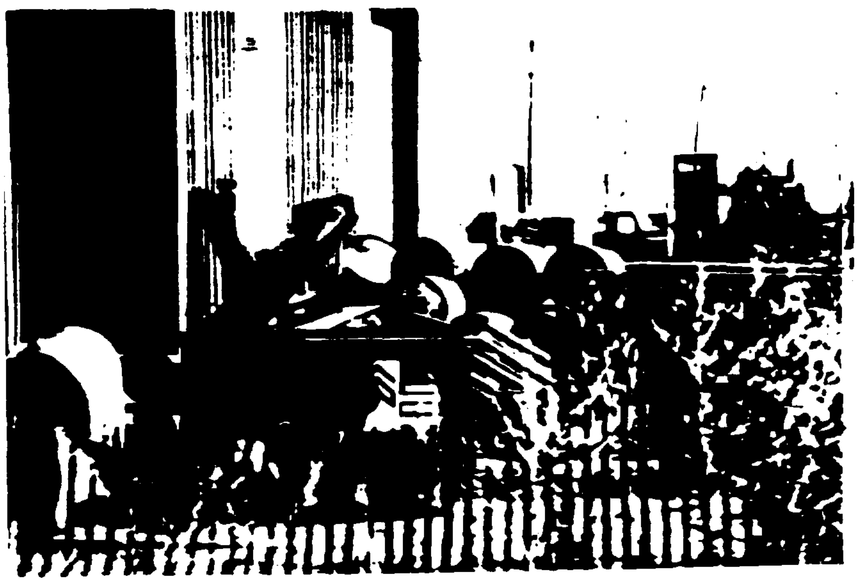
PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Same camera and lens used as above



Picture #4

CER 051892

DESCRIPTION: Close-up of drums on Ruan Transport Co. property. Hoping to [illegible] some kind on drums

E000850

FIELD PHOTOGRAPHY LOG SHEET

Page 7

DATE March 23 1982

TIME 11:58 (A.M.) P.M.

DIRECTION: N NNE NE ENE
(E) ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny wind from SSW
10-15 mph Temp ~60°F

SITE Sauget II / Dead Creek

TDD# FS - E203 - 02

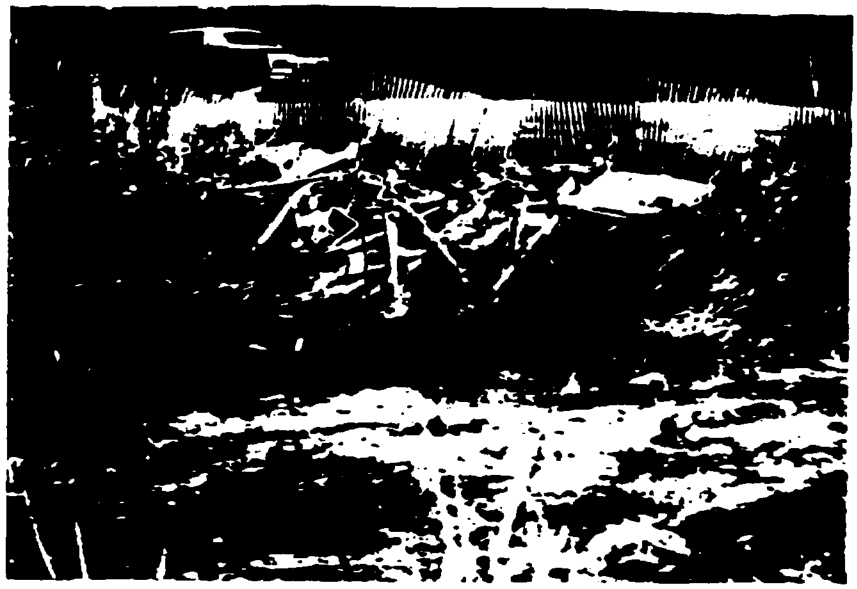
PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 w/
zoom f: 90mm ~ 230m
1: 4.5 lens



Picture #5

DESCRIPTION: Showing seepage from bank (pipe w/ inside diameter of 3 inches)

DATE March 23 1982

TIME 11:56 (A.M.) P.M.

DIRECTION: N NNE NE ENE
(E) ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

TDD# FS - E203 - 02

PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Same camera and lens
used as above

Picture #6

CER 051893

DESCRIPTION: Close up of pipe which seems to be the source of seepage

E000851

DATE March 23 1982

TIME 11 : 58 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, wind from SW 5-10mph Temp ~60°F

SITE Sauget II / Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Camera Canon AE-1 w/ Canon FD 50 mm f1:1.8 Lens

Picture #7

DESCRIPTION: Area of seepage in northern portion of Dead Creek near Cerro Corp.

DATE March 23 1982

TIME 11 57 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

TDD# FS 8203-02

PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Same camera and lens as used above

Picture #8

DESCRIPTION: Drums and "oily" substance in pit on Cerro Corp property. Readings with O.V.A. - 0ppm, H-Nu (11.7 lamp) - 3-4ppm.

CER 051894

E000852

FIELD PHOTOGRAPHY LOG SHEET

Page 11

DATE March 23, 1982

TIME 12:00 noon A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, wind from S-SW @ 5-10 mph. Temp ~60°F

SITE Sauget IL/Dead Creek

TDD# FS-8203-02

PHOTOGRAPHED BY:

Don Woods

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 w/ Canon FD 50 mm f:1.8 lens

Picture #9

DESCRIPTION: Another pit with drums and "oily" substance on Cerro Corp. property

DATE

TIME A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER

SITE

TDD#

PHOTOGRAPHED BY:

SAMPLE ID# (if applicable)

PHOTO

DESCRIPTION:

CER 051895

E000853

CER 051896

E000854

ecology and environment, inc.
223 WEST JACKSON BLVD.,
CHICAGO, ILLINOIS 60606

DEAD CREEK

Neg. missing for pic #23
OKelly 4/2/92 (April used it for getting a copy to send to Buffalo)

Neg still missing for pic #23
OKelly 7/21/92
FOUND 7/21/92 @ Noon OKelly

IL-103-CS

FIELD [illegible] LOG SHEET

Dead Creek

Page 1

DATE March 23, 1982

TIME 11:10 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W

WEATHER Sunny, light wind from S [illegible]

SITE Sauget 2, Dead Creek

TDD# F5 [illegible]

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

[illegible]

Picture #12 [illegible]

DESCRIPTION: Looking up (northerly) Dead Creek from Judith Lane towards Monsanto and Cerro Corporation

DATE March 23, 1982

TIME 4:40 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget 2 / Dead Creek

TDD# F5 8203 02

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Same camera and lens [illegible]

Picture # 13

DESCRIPTION: Ellen Black and [illegible] preparing to [illegible]

CER 051897

E000855

FIELD PHOTOGRAPHY LOG SHEET

Page [illegible]

DATE March 25 1986

TIME 9:50 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER [illegible]

[illegible]

SITE Target 2 Devil Creek

TOD# [illegible]

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

[illegible]

Picture #14

DESCRIPTION: [illegible] site work [illegible] beginning [illegible] in Devil Creek

DATE March 25 1986

TIME 9:55 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Target 2 - Devil Creek

TOD# [illegible]

PHOTOGRAPHED BY:

Claude E. Mays III

SAMPLE ID# (if applicable)

N/A

Same [illegible] as above

Picture #15

DESCRIPTION: [illegible] breathing height [illegible]

CER 051898

E000856

FIELD PHOTOGRAPHY LOG SHEET

DATE March 23 1982

TIME 9 5[illegible] (A.M.) P.M.

DIRECTION: N NNE (NE) ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER [illegible]

[illegible]

SITE [illegible]

TDD# [illegible]

PHOTOGRAPHED BY:

[illegible]

SAMPLE ID# (if applicable)

N/A

[illegible]

Picture #1[illegible]

DESCRIPTION: [illegible] Walnut [illegible]

DATE March 23 1982

TIME [illegible] 58 (A.M.) P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER [illegible]

SITE [illegible] / [illegible]

TDD# [illegible] 8203 02

PHOTOGRAPHED BY:

[illegible] E Mays III

SAMPLE ID# (if applicable)

N/A

[illegible]

Picture #[illegible]

CER 051899

DESCRIPTION: [illegible]

E000857

FIELD PHOTOGRAPHY LOG SHEET

Page 4

DATE March 23 1982

TIME [illegible] A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny light wind from S ([illegible] mph) Temp [illegible]

SITE Sauget II / Dead Creek

TDD# F5 8203-02

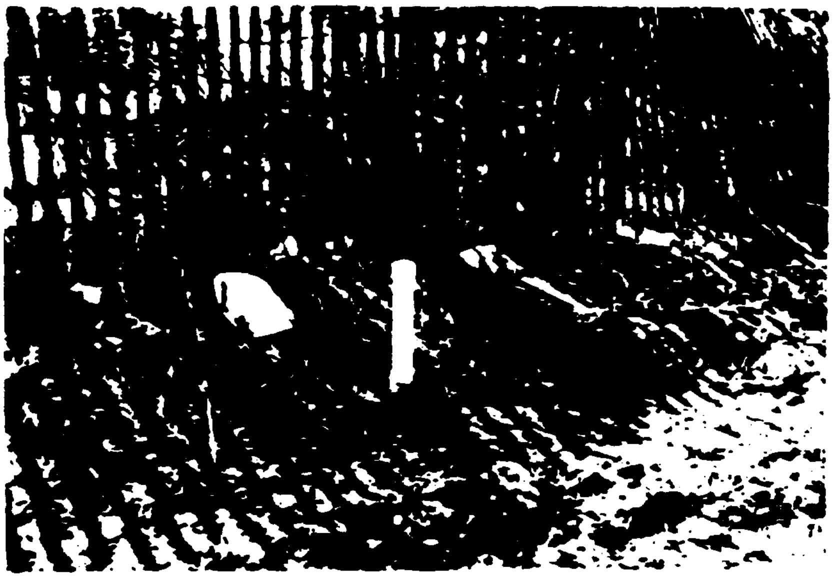
PHOTOGRAPHED BY:

Charles E. Mayes III

SAMPLE ID# (if applicable)

N/A

Camera: Canon AE-1 w/ Canon FD 50mm f1.8 lens



Picture #13

DESCRIPTION: Shows groundwater well put in by Ron St John while working with the Illinois EPA in the Northern Dead Creek study

DATE March 23 1982

TIME 10:06 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget II / Dead Creek

TDD# F5-8203-02

PHOTOGRAPHED BY:

Charles E. Mayes III

SAMPLE ID# (if applicable)

N/A

Same camera and lens as above

Picture #[illegible]

CER 051900

DESCRIPTION: Site #4 - [illegible] 4 to 5 am

E000858

FIELD PHOTOGRAPHY LOG SHEET

Page [illegible]

DATE March 23 1982

TIME [illegible] A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, light wind [illegible] Temp ~ [illegible]

SITE [illegible]

TDD# F5 - 8[illegible]

PHOTOGRAPHED BY:

[illegible] Mays III

SAMPLE ID# (if applicable)

N/A

[illegible]

Picture #

DESCRIPTION: [illegible]

DATE March 23 1982

TIME [illegible] A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER [illegible]

SITE [illegible] / [illegible] Creek

TDD# F5 [illegible]

PHOTOGRAPHED BY:

[illegible] Mays III

SAMPLE ID# (if applicable)

N/A

[illegible]

Picture #

CER 051901

DESCRIPTION: [illegible]

E000859

FIELD PHOTOGRAPHY LOG SHEET

Page ___

DATE March 23 1982

TIME 10:15 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, Slight wind
(from S or SW) Temp ~ 70 F

SITE Target II / Dead Creek

TDD# F5 8203-02

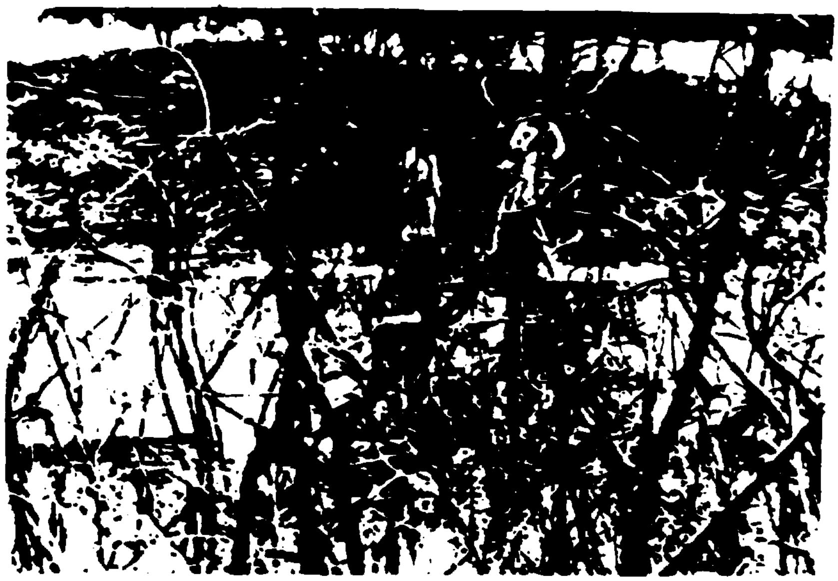
PHOTOGRAPHED BY:

Claude E Mays III

SAMPLE ID# (if applicable)

N/A

Camera Canon AE-1 with Canon FD 50mm F1.8 lens



Picture # 22

DESCRIPTION: Shows polyethylene [illegible] container in creek

DATE March 23 1982

TIME 10:30 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Target II / Dead Creek

TDD# F5 8203-02

PHOTOGRAPHED BY:

Claude E Mays III

SAMPLE ID# (if applicable)

N/A

Same camera and lens as used above

Picture # 23

DESCRIPTION: Taking sample of seepage and placing it into [illegible] for [illegible] analysis with [illegible]

CER 051902

E000860

FIELD PHOTOGRAPHY LOG SHEET

Page 7

DATE March 23 1982

TIME 11:40 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, slight wind from S (~5mph) Temp ~ 50°F

SITE Sawyer Rd / Dead Creek

TDD# FS-[illegible]-02

PHOTOGRAPHED BY:

[illegible] L. Mays II

SAMPLE ID# (if applicable)

N/A

Camera Canon AE-1 [illegible]
Canon FD 50mm f1.8 Lens

Picture #1

DESCRIPTION: Shows Dead Creek and surrounding area south of Judith Lane.

DATE March 23 1982

TIME 11:55 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, wind from S-[illegible] ~5 mph, Temp ~[illegible]°F

SITE Sawyer Rd / Dead Creek

TDD# FS-[illegible]-02

PHOTOGRAPHED BY:

Dennis Woods

SAMPLE ID# (if applicable)

N/A

Canon AE-1 Camera
[illegible]

Picture #2

CER 051903

DESCRIPTION: Showing [illegible]

E000861

FIELD PHOTOGRAPHY LOG SHEET

Page ___

DATE March 23 1982

TIME 11:50 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny wind from S

TEMP

SITE Seaget IL / Dead Creek

TDD# FS

PHOTOGRAPHED BY:

Don [illegible]is

SAMPLE ID# (if applicable)

N/A

Camera Canon AE-1 w/
Zoom F- 70mm ~ 210 mm
f 4.5 lens

Picture # 3

DESCRIPTION: Area of seepage just south of Cerro Copper ... and Crossing ... Dead Creek

DATE March 23 1982

TIME 11:51 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget IL / Dead Creek

TDD# FS 2263 - 02

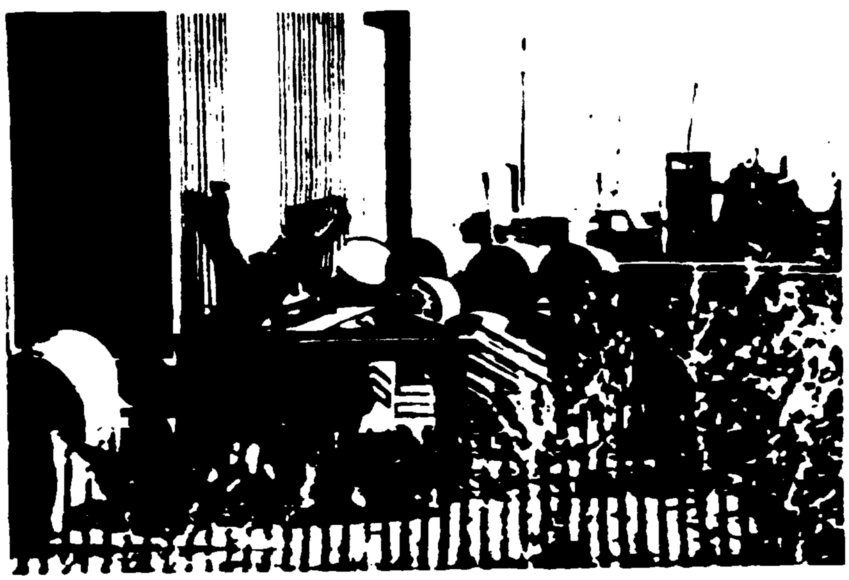
PHOTOGRAPHED BY:

Don [illegible]

SAMPLE ID# (if applicable)

N/A

Same camera and lens used as above



Picture # 4

CER 051904

DESCRIPTION: Close up of drums on ... Transport ... property ... same kind on drums

E000862

FIELD PHOTOGRAPHY LOG SHEET

Page 9

DATE March 23 1982

TIME 11:52 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny wind from S [illegible]
[illegible] Temp ~60°F

SITE Sauget IL / Dead Creek

TDD# F5-8203-02

PHOTOGRAPHED BY:
Dan [illegible]

SAMPLE ID# (if applicable)
N/A

Camera Canon AE-1 w/
Zoom f- [illegible]mm ~ 2x m
1:4.5 lens

Picture #5

DESCRIPTION: Showing seepage from bank (pipe w/ inside diameter of 3 inches)

DATE March 23 1982

TIME 11:52 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Sauget IL / Dead Creek

TDD# F5-8203-02

PHOTOGRAPHED BY:
Dan [illegible]

SAMPLE ID# (if applicable)
N/A

Same camera and lens
used as above

Picture #6

CER 051905

DESCRIPTION: Close up of pipe which seems to be the source of [illegible]

E000863

FIELD PHOTOGRAPHY LOG SHEET

DATE March 23 1982

TIME 11:38 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, wind from S [illegible] Ambient Temp ~60°F

SITE Singer II / Devil Creek

TDD# F5 [illegible]263-02

PHOTOGRAPHED BY:

Dan Woods

SAMPLE ID# (if applicable)

N/A

Camera Canon AE-1 w/ Canon FD 50 mm f1.8 lens

Picture #7

DESCRIPTION: Area of seepage in northern portion of Devil Creek near [illegible] Corp

DATE March 23 1982

TIME 11 51 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Same as above

SITE Singer II / Devil Creek

TDD# F5 8203-02

PHOTOGRAPHED BY:

Dan Woods

SAMPLE ID# (if applicable)

N/A

Same camera and lens as used above

Picture #8

DESCRIPTION: Drums and 'oily' substance in pit on [illegible] Corp. property. Readings [illegible] HNu [illegible] (lamp) [illegible] ppm

CER 051906

E000864

FIELD PHOTOGRAPHY LOG SHEET

DATE March 23 1982

TIME 12 [illegible] A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER Sunny, wind from [illegible]
[illegible]

SITE [illegible] R/Deal Creek

TDD# FS-[illegible] 02

PHOTOGRAPHED BY:
Tom Woods

SAMPLE ID# (if applicable)
N/A

Camera Canon AE-1 w/
Canon FD 50mm f:1.8
lens

Picture # 9

DESCRIPTION: Another pit with drums and "oily" substance on [illegible] Corp property

DATE

TIME A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSW SW WSW
W WNW NW NNW

WEATHER

SITE

TDD#

PHOTOGRAPHED BY:

SAMPLE ID# (if applicable)

PHOTO

DESCRIPTION:

CER 051907

E000865